The **Science** and ***Art*** of Presbyopic Contact Lens Fitting

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Disclosures (TQ)

- Bausch & Lomb
- CooperVision
- GPLI
- LENTECHS, LLC
- STAPLES Program
- JJ VC Vistakon

Disclosures (EB)

- LENTECHS, LLC
- Consultant to the Contact Lens Manufacturers Association (i.e., Executive Director, GP Lens Institute)

Art & Science: Complimentary Skills Sets

YES . . . Science IS Important

Why is Science Important?

Science teaches how things work, and it is important to advances in life such as technology and medicine. Science is part of our everyday life, from cooking and gardening, to recycling and using a computer.

MULTIFOCAL
vs
MONOVISION

Let Science Speak

MULTIFOCAL vs MONOVISION:

- MV vs Essential GP (Johnson, 2000)
  - **75%** preference for multifocal
- MV vs Acuvue Bifocal (Situ et al, 2003)
  - **68%** preference for multifocal
- MV vs Soflens MF (Richdale et al, 2006)
  - **76%** preference for multifocal
- MV vs Air Optix Aqua MF (Woods et al, 2015)
  - **51%** preference for multifocal
  - 37% preference for monovision
  - 12% didn't like either

"That's not been my experience"

MULTIFOCAL vs MONOVISION:

- MV vs Acuvue Bifocal (Situ et al, 2003)
  - 68% preference for multifocal
  - **Issues with near vision in low light**
- MV vs Soflens MF (Richdale et al, 2006)
  - 76% preference for multifocal
  - **Issues with near vision in low light**

NEW SCIENCE ON MONOVISION

- https://penntoday.upenn.edu/news/Penn-research-one-step-closer-clinical-fix-dangerous-side-effects-monovision

Restaurant Tools

- Magnifiers
- Light
- Apps

Setting the Stage for Success

- Know the science
  - Multifocals out-perform monovision: 7/10x
- Know the strengths and weaknesses
  - Freedom and functionality
  - Eg. Challenges at near in low light
- Prepare the pre-presbyopes

Presbyopia is not a surprise!

Setting the Stage for Success

- Know the science
  - Multifocals out-perform monovision: 7/10x
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  - Challenges at near in low light
- Prepare the pre-presbyopes
- Fit them early

Setting the Stage for Success

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- Know the strengths and weaknesses
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- Prepare the pre-presbyopes
- Fit them early
- Define success for your patient…

The New Rules of the Vision Game

- Multiple tools
  - Magnification
  - Light
  - Apps

The New Rules of the Vision Game

- Multiple tools
  - Magnification
  - Light
  - Apps
- Goal: “Meet most of your needs most of the time”

Setting the Stage for Success

- Know the science
  - Multifocals out-perform monovision: 7/10x
- Know the strengths and weaknesses
  - Challenges at near in low light
- Prepare the pre-presbyopes
- Fit them early
- Define success for your patient…

  …and yourself!

What's the best way to assess MF performance?

- Woods, J, et al (2009)
  - Assessed both objective and subjective results/ratings
    - **Objective testing (exam room)**
      - Monovision "best performer" for high- and low-contrast near vision tests
    - **Subjective ratings ("real world")**
      - Monovision "lowest performer"
      - Multifocal contact lenses "highest performer" in areas such as: Night driving, television, computer

Woods, J, et al. "Early Symptomatic Presbyopes – What Correction Modality Works Best?" *Eye & Contact Lens* 2009;5: 221 – 226.

What do we fit?

- The Decision Drivers
  - Astigmatic error
    - Where's the flinch level?

TABLE 5.
Visual acuity improvement from using a toric contact lens instead of a spherical lens

Test condition	≤1 D	1.25–2 D
Photopic		
High contrast	3 letters	11 letters
	0.06 ± 0.10	0.22 ± 0.16
Low contrast	3.5 letters	12.5 letters
	0.07 ± 0.14	0.25 ± 0.14
Mesopic		
High contrast	5.5 letters	11 letters
	0.11 ± 0.12	0.22 ± 0.16
Low contrast	3.5 letters	8.5 letters
	0.07 ± 0.12	0.17 ± 0.13

Eyes were separated by having ≤1.00 D of astigmatism or 1.25 to 2 D of astigmatism (as referenced to the corneal plane).

Richdale, Kathryn et al, *Visual acuity with spherical and toric soft contact lenses in low-to moderate- astigmatic eyes*, Optom and Vision Science, 84(10):969-975, Oct 2007

The Astigmatic Component

- 0.75 DC is the "flinch level"

Prevalence of 0.75 DC or greater

- In at least one eye: 47.4%
- In both eyes: 24.1%
- Myopes vs Hyperopes: 31.7% vs 15.7%
- WTR vs ATR: 32.9% vs 29.1%
- Conclusion:
  - "We estimate that approximately 1/3 of potential CL wearers require astigmatic correction"

Young G et al, **Prevalence of astigmatism in relation to soft contact lens fitting,** Eye Contact Lens. Jan 2011

Astigmatism and Age

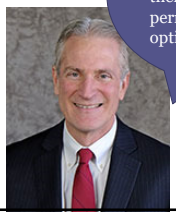
- *Prevalence* of astigmatism increases with age[1,2,3]
- *Amount* of astigmatism increases with age[3]
  - 0.05D per decade
- *Axis* changes from WTR to ATR[2,3,4]
  - Due to corneal shape changes

1. Sanfillippo PG et al, Acta Ophthalmol, 2015 (Australia)
2. Liu YC et al, Invest Ophthalmol Vis Sci, 2011 (China)
3. Schuster AK et al, Graefe's Arch Clin Exp Ophthalmol, 2017 (Germany)
4. Leung TW et al, Optom Vis Sci, 2012 (Hong Kong)

Corneal Astigmatism = Spectacle Astigmatism

- A Multitude of Multifocal Options!
  - Toric Soft MF
  - Hybrid MF
  - GP MF (Corneal and Scleral)

GP MULTIFOCAL OPTIONS



And when those soft lenses don't work, there are always gas permeable lens options!

Benefits of GP Multifocal Lenses

- Good to great VISION
- (avoiding the "blur from ????" shown on right
- Ocular Health
- Astigmatic Correction
- Applications in Dry Eye Management (i.e., sclerals)

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ORIGINAL ARTICLE

Visual Performance of Subjects Wearing Presbyopic Contact Lenses

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University of Illinois at Chicago, Chicago, Illinois (ASR), and University of Missouri–St. Louis College of Optometry, St. Louis, Missouri (ESB, VL)

ABSTRACT

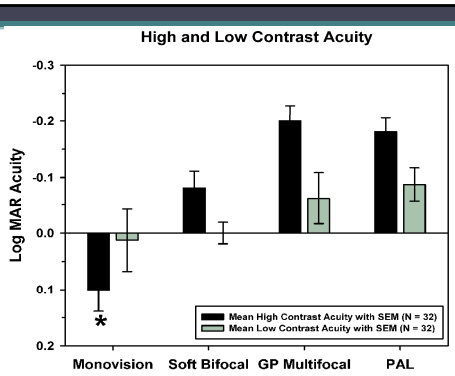
Purpose. The purpose of this study is to assess the visual performance of subjects wearing gas-permeable (GP) multifocal contact lenses, soft bifocal contact lenses, GP monovision lenses and spectacles.

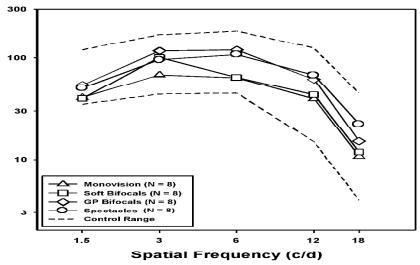
Methods. The study included 32 subjects between the ages of 42 and 65 years wearing GP monovision, Acuvue (Johnson & Johnson) bifocals, GP Essentials (Blanchard) multifocals, and progressive addition lenses (PAL; spectacles group). There were eight subjects in each of these groups who were already wearing these modalities. Binocular low (18%) and high (95%) contrast acuities were recorded using the Bailey-Lovie chart; binocular contrast sensitivity from 1.5 to 18 cycles per degree (cpd) measured with the Vistech VCTS 6500 system, and monocular glare sensitivity at three luminance settings (400, 100, and 12 foot lamberts) was measured using the brightness acuity tester (BAT). Binocular near visual task performance (a modified version of letter counting method used in previous presbyopic studies) was also assessed.

Results. For the contact lens-wearing groups, subjects wearing GP multifocals provided the best binocular high and low contrast acuity followed by soft bifocal wearers. There was relative parity between the binocular high and low contrast acuity with PAL and GP multifocal wearers. Monovision acuity, measured binocularly, was determined to be lower than the other three groups with this difference being most significant with high contrast acuity. Among contact lens-wearing

METHODS

- N = 32 (range 42 – 65)
- 8 each for GP monovision, soft bifocal, aspheric GP multifocal & PALs
- Binocular low (18%) and high (95%) contrast acuities (Bailey-Lovie)
- Binocular contrast sensitivity (15 – 18cpd) with Vistech VCTS 6500
- Monocular glare sensitivity @ 3 luminance settings (400, 100 and 12 foot lamberts) using brightness acuity tester (BAT)





MONOVISION VERSUS CL BI/MULTIFOCALS

- Rajagopalan A, et al: CONCLUSIONS
- GP wearers exhibited highest contrast sensitivity at all frequencies, high and low contrast acuity and least disability glare; soft bifocals were second; monovision last in all categories

BUT CL MULTIFOCALS DO NOT WORK . . . UNTIL YOU FIT THEM!

- Atkins, Morgan & Morgan (Cont Lens Ant Eye, 2009):
- 91 non CL wearers placed into reactive and proactive groups (in the latter CLs were actively discussed as a corrective option)
- 33% of proactive purchased CLs; 13% of reactive: **2.5 fold increase**
- Above study repeated for presbyopes (Plowright, Morgan, BCLA, May, 2019)
- N = 196; 17% (primarily FM) of proactive purchased CLs; 8% of reactive

. . . and they have become the option of choice

(Nichols J, Starcher L, CL Spectrum 1/20)

- Survey via **Jeff Johnson OD** (Vice-President, Robert W. Baird & Co.)
- For presbyopes wearing CLs, practitioner preference was:
  - Multifocal lenses: 75% (59% in 2008)
  - Monovision: 16% (27% in 2008)
  - Over-spectacles: 9% (14% in 2008)

PRESBYOPIC APPLICATIONS IN 2020

- Corneal GP Lens Designs
- Scleral Lens Designs
- Post Refractive Surgery Designs
- Hybrid/Combination Designs

RULE OF THREE'S

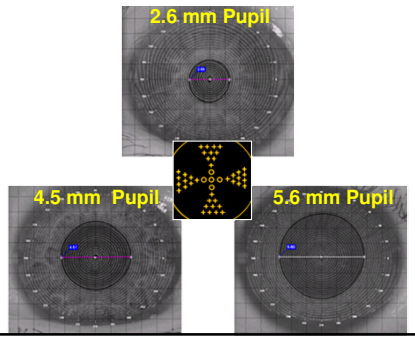
- Number of Fits
- Pre-Fit
- Fitting
- Problem-Solving

ADAPTATION/LENS CHANGES

- If interested, present all options to them
- Lens changes are the rule (1/eye initially, then 1/patient)
- AS MUCH AS 6 - 8 weeks to adapt
- No Monday morning surprises
- BOTTOM LINE: "If you are patient and motivated, there is an 80% success rate with these lenses."

PRE-FIT FACTORS

- Pupil Size
- Tear Film
- Lower Lid Position/tightness

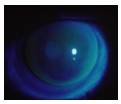


Varying power profile within the pupil can result in successful aspheric/concentric fits

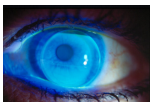
- Due to variance in pupil size and add power, laboratories are making center-distance corneal aspheric and concentric GP multifocal lenses with multiple effective diameter center-distance zones to allow for variance in pupil size and add power
- Monsalvez-Romin, et al used five separate center-distance zones in GP multifocal lenses and found the two smallest zones favored the more advanced presbyope (near vision) and the two greatest zones favored distance vision.

GP Multifocal Designs

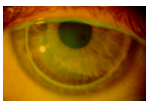
High Eccentricity Back Surface



Low Eccentricity Back Surface



Translating Design



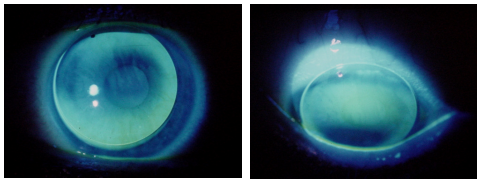
Front Surface Asphere

ASPHERIC ADVANCEMENTS

Has evolved into a very popular type due to advancements in technology

- New Technology resulting in better polished surfaces
- Addition of higher add power lenses
- Lower eccentricity lens designs
- Translation???

ASPHERIC LENS TRANSLATION

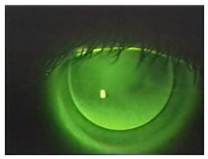


ASPHERIC CANDIDATES

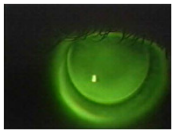
- Any Add Power (Don't R/O High)
- Computer use
- Athletes
- Low lower lid &/or loose lids
- Small-avg. pupil size
- (very) Critical Vision not essential

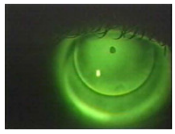
ASPHERIC MULTIFOCAL FITTING

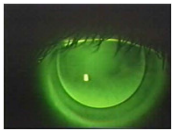
- **Front surface fit "On K"** Back surface fit 1 - 1.5D steeper than K
- **Must center with limited movement with the blink**
- Easy to fit via manufacturers' fitting guide/user friendly
- **Empirical Fitting !!**
- Good design to start with



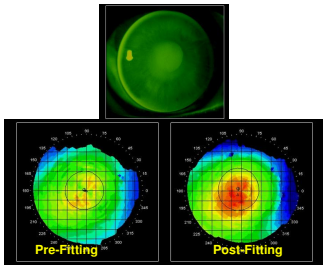
Posterior Aspheric MFs







Topographic Changes with Posterior Aspheric Lens Designs

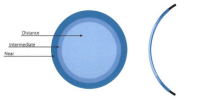


FRONT SURFACE ASPHERIC MULTIFOCAL DESIGNS

- Have the benefit of avoiding back surface molding/topography changes
- Once again, **order empirically**
- Designs have variable add powers to meet patient needs: (i.e., often making effective center distance zone smaller with increase add power)
- OPTICALLY THEY PROVIDE ABOUT .37D greater add than BS aspherics

REPRESENTATIVE EXAMPLE

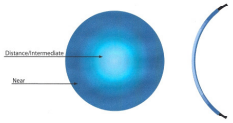
Front Surface Technology



MagniClear & MagniClear*plus*

)

Front Surface Technology



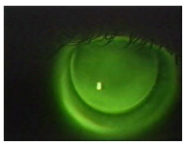
Renovation & RenovationE

FITTING AND EVALUATION

- Same as a soft MF
- Wait for it…

ASPHERIC TROUBLESHOOTING

- Inferior Decentration/Excessive Movement: Steeper Base Curve
- Insufficient Add Power:
  - Select Higher Add Lens Design
  - Use "Modified Bifocal"



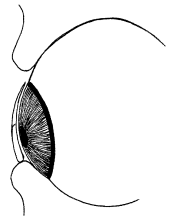
TRANSLATING VISION

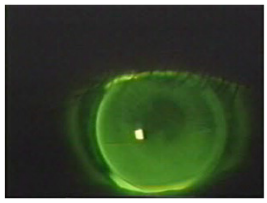
- Prism Ballasted & sometimes Truncated
- Crescent/Executive Seg
- High Dk Material
- Near image moves in front of pupil with downgaze
- Typically rests on or near the lower lid

Reading Position of Translating Bifocal

Base Curve Selection (courtesy Firestone Optics)

- Proper base curve selection helps the lens to translate smoothly upward to position the seg line slightly above the pupil center during down gaze

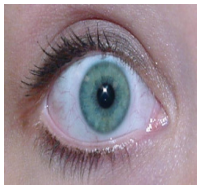




TRANSLATING VISION: CANDIDATES

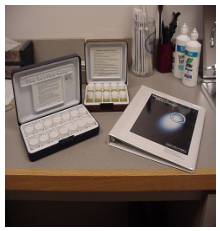
(Potter, CL Spectrum Dec., 2016)

- Critical vision demands
- Astigmatic & failure in other CL modalities due to vision
- Any add powers (high add/limited IM)
- Lower lid near limbus/good tonicity
- Aspheric does not center
- Inferior Apex

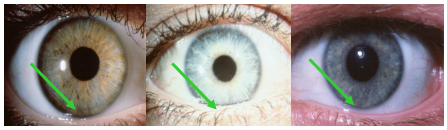


FITTING NUGGETS

- Diagnostic set(s)
- Follow manufacturer's fitting guide
- Trial Lens O/R.
- Translating Pearls:
  - Position of lower lid to limbus
  - Seg line to lower pupil position
  - Evaluate translation in downward gaze



Lid Position



Optimal **Okay** **???**

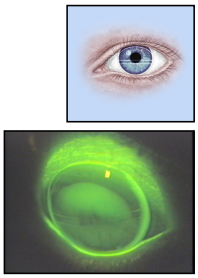
CRASH !!!!!!!!!!

SOLUTIONS (X-CEL)

- One-piece crescent with monocentric optics
- Standard Lens = 9.6mm OAD; medium Prism; seg line 1mm below geometric center
  - +2.00D add, no truncation
  - User Friendly
  - Fit and seg position similar to Tangent Streak (BCR slightly flatter than "K"; seg line at lower pupil margin)

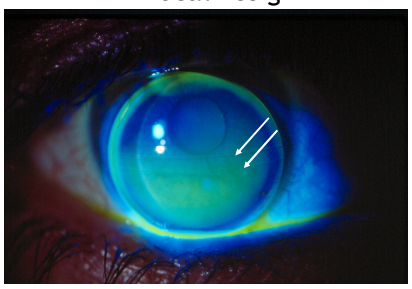
Translating Designs Intermediate Need

- Examples:
  - Llevations Trifocal (Tru-Form)
  - Triune (Tru-Form)
  - Mandell Seamless (ABB-Concise)
  - Tangent Streak (ABB)
  - EZEyes (essilor)
  - Accent (Accu Lens)
  - ESSential Solutions (X-Cel)
- Modified Bifocal
- Over-Spectacles



Courtesy of Ed Bennett, O.D.

Trifocal Design



TRANSLATING VISION PROBLEM-SOLVING

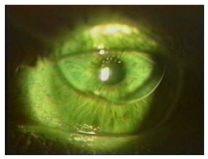
- Excessive Rotation
- Lens Positions Too High
- No Lens Translation

EXCESSIVE ROTATION

- Flatten Base Curve Radius by 0.50D
- Increase Prism 0.50PD

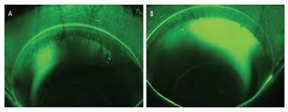
LENS POSITIONS TOO HIGH

- Increase Prism by 0.50PD
- Flatten BCR 0.50D



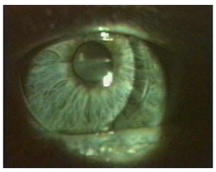
NO LENS TRANSLATION

- Flatten Base Curve by 0.50D
- Increase prism and/or truncation



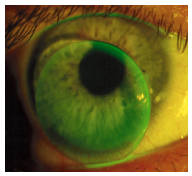
BLUR AT DISTANCE

- Lens too high: Increase prism
- Lens too low: Increase OAD
- Seg Height is too high
- Excessive movement



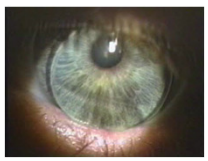
Superior Flare

- Lens is too small
- Fit a larger lens to increase vertical height

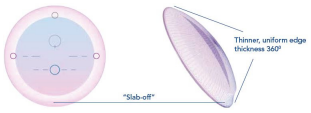


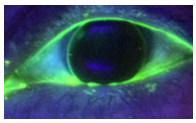
BLUR AT NEAR

Seg height too low
No translation
Patient drops head to read, not eyes
Excessive lens rotation



Progressive Optics



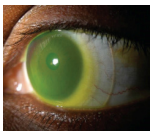


PRESBYOPIC APPLICATIONS IN 2020

- Corneal GP Lens Designs
- Scleral Lens Designs
- Post Refractive Surgery Designs
- Hybrid/Combination Designs

Good Candidates for Scleral Multifocals
(Woo, GSLS, 2015; Messer et al CL Spectrum March ,2015)

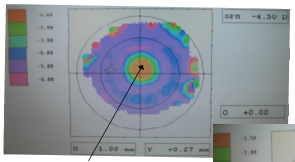
- Patients with irregular corneas wearing sclerals, desiring more freedom from glasses
- Patients with REGULAR corneas
  - Offering the best of both worlds: GOOD vision and great comfort
- Patients with dry eyes
- Post refractive surgery patients (RK, LASIK, etc)
  - These patients never wanted to wear glasses anyway!
  - Usually more motivated!



Scleral Multifocal Designs

- Most are concentric or aspheric designs
- Many scleral MF are center near, which have a similar design to other soft or HYBRID designs although a few center-distance are available for the emerging presbyope (Barnett, CL Spectrum 2017;32(9:suppl):15-19)
- Very customizable!
  - Changing diameter, base curve: no problem!
  - Some designs can adjust add power and zone size
  - MOST designs available in toric or quadrant specific designs.

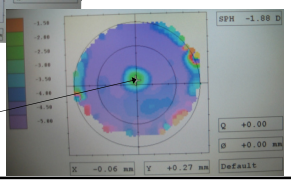
So2Clear Multifocal Lens (Dakota Sciences/Art Optical)



Center Near, Front Aspheric
***Allows for vision at all distances**
***Strength of add and size of add are customizable to the individual patient.**

Center Add Power +3.50

Add Zone = 2.25 mm



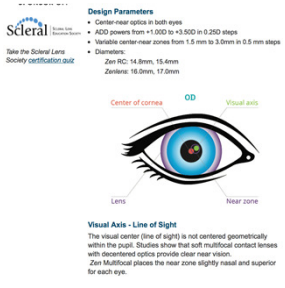
Center Add Power +1.88

Add Zone = 1.50 mm

Designs are being introduced with decentered optics (i.e., axis slightly sup-nasal)

- Scleral lenses – due to both the greater elevation of the nasal (versus temporal) sclera – in combination with the mass tend to decenter slightly inferior-temporal.
- Decentering the center-near optics has resulted in improved visual response (Ramdass, et al: poster presented at GSLS, January, 2018)
- Over-topography can help in determining amount of decentration and recently introduced multifocal scleral lenses can decenter their optical center superior-nasally. (Gelles, et al: Rev Cornea Contact Lenses, Sept 15, 2019)

Zenlens Scleral MF with decentered optics)



PRESBYOPIC APPLICATIONS IN 2020

- Corneal GP Lens Designs
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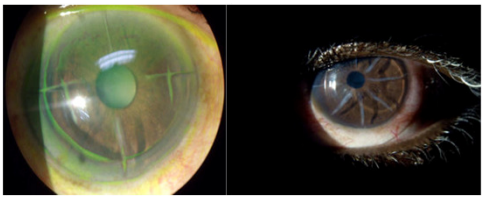
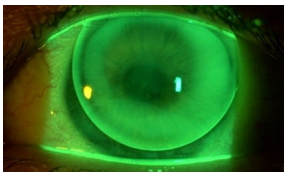
POST-REFRACTIVE SURGERY COMPLICATIONS (www.lasikcomplications.com)



POST-REFRACTIVE SURGERY MULTIFOCAL DESIGNS

- Typically reverse geometry designs with add on the front surface
- BENEFICIAL FOR OBLATE CORNEAL SHAPE (TYPICAL OF POST-RS) AND UNABLE TO ACHIEVE GOOD VISION WITH SOFT DESIGNS



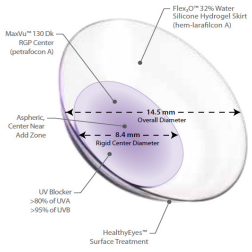
PRESBYOPIC APPLICATIONS IN 2020

- Corneal GP Lens Designs
- Scleral Lens Designs
- Post Refractive Surgery Designs
- Hybrid/Combination Designs

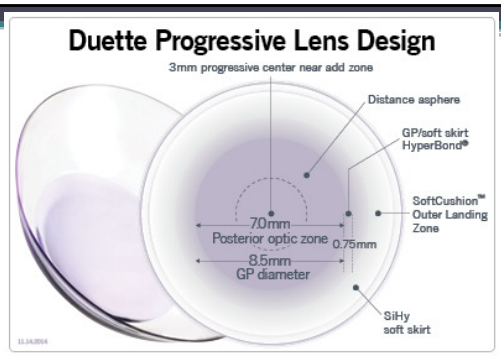
Patient Candidates for Hybrid Multifocals

- Astigmatic presbyopes
- Those not desiring GP Multifocals or could not adapt
- Soft multifocal patients with astigmatism
  - Great option since soft multifocals for astigmats is limited
- Soft toric monovision patients that want better vision
- Patients wanting to try the latest technology

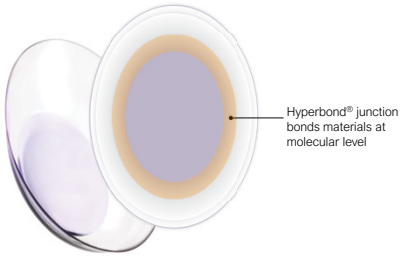
Built on the Duette™ Platform



Duette Progressive Lens Design



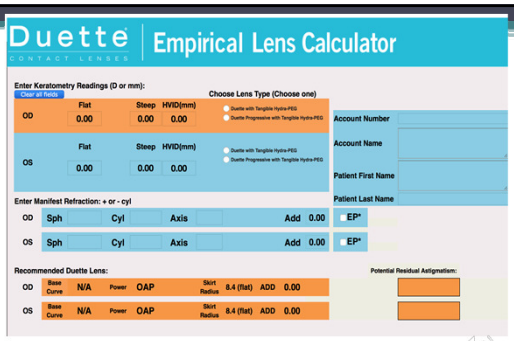
SynergEyes Hybrids



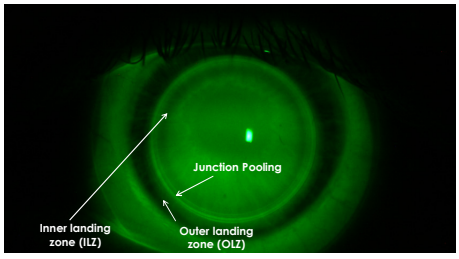
Available Parameters

Base Curves	7.1mm to 8.3mm in 0.2mm steps
Skirt Curves	8.7 (flat2), 8.4 (flat) and 8.1 (medium)
Lens Powers	+5.50D to -10.00D
Add Zone Size	3.0mm
Add Powers	+1.00D, +1.75D and +2.50D

Duette Empirical Lens Calculator



Skirt Determination – Ideal Fit



What's New???

- SynergEyes Progressive Center-Distance
  - A viable option for emerging, early presbyopes
  - Provides FlexOptics to provide an adjustable center distance zone size and adds up to +5.00D
  - Center distance zone range from 1.8-4.00 mm

BOTTOM LINE: LENS SELECTION

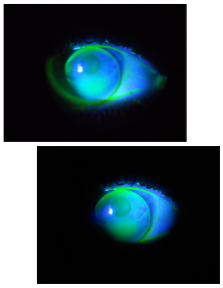
- GP WEARER NOW PRESBYOPIC: **ASPHERIC GP**
- SOFT MULTIFOCAL/MONOVISION WEARER C/O VISION: **ASPHERIC GP, SEGMENTED, TRANSLATING GP, OR HYBRID**
- ASTIGMATIC NON-CONTACT LENS WEARER: **ASPHERIC GP, SEGMENTED TRANSLATING GP, OR HYBRID**
- ASTIGMATIC PRESBYOPE DESIRING NO DECREMENT IN DISTANCE OR NEAR VISION: **SEGMENTED, TRANSLATING GP**
- SCLERAL LENS WEARER NOW PRESBYOPIC: **SCLERAL MF**
- PRESBYOPE WITH DRY EYES: **SCLERAL MF**
- PRESBYOPE WITH IRREGULAR CORNEA: **SCLERAL MF OR OVER-READERS**

RESOURCES

- Your best resource is your laboratory consultant
- They can can provide diagnostic fitting sets, online resources for the fitting and troubleshooting of their designs, and well as very good advice based upon extensive experience
- If possible, topographies and photos can be beneficial as well

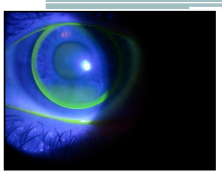
CL Fit

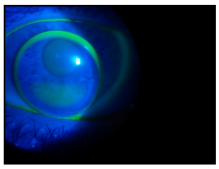
- Diagnostic Fit
- Ordered X-Cel Solutions
  - OD -4.00 / 7.58 / 9.2
  - OS -4.00 / 7.58 / 9.2
    - +2.00 Add OD/OS
  - Seg 1.0 mm below geometric center
  - Max prism with as thin an edge as possible superiorly



OS Fit Assessment

- OS still picked up too superiorly
- Contacted lab; they recommended ExtraMax prism
- Problem Solved! Patient very happy with vision
- Pearl: Contact your consultants regularly . . . The more you do so, the better specialty fitter you will become





OTHER GP MULTIFOCAL RESOURCES

- Bennett ES, Quinn TG. Multifocal lens decision-making 101. Contact Lens Spectrum 2014;29(4):30-38.
- Messer B. GP Multifocal Fitting and Troubleshooting. August, 2020. www.gpli.info/webinars-archived/
- Potter RT. New designs in translating bifocals and multifocals. Contact Lens Spectrum 2016;31(12):30, 32-34, 55.
- Wang Y, Jackson JM. Corneal GP multifocal fitting and troubleshooting. Contact Lens Spectrum 2020;35(6):38-41,48,49.
- Bennett ES, Henry VA, Richdale K, Benoit DP. Multifocal contact lenses. In Bennett ES, Henry VA. Clinical Manual of Contact Lenses (5th ed.). Philadelphia, Wolters Kluwer 2020:440-491.

Corneal Astigmatism ≠ Spectacle Astigmatism

- GP Options
  - Corneal GP lens
    - Often limited by need for toric and MF optics on same surface
    - Rotational stability strategies?
  - Scleral lens
    - Rotational stability strategies?
- Toric Soft Options

Visual Performance of MF Toric SCL

- 20 subjects
  - 45 to 65 yo
  - 0.75DC to 2.75 DC
- Cross-over design
- Soft Toric MF vs Soft Toric MV
- 1 month wear of each design

Madrid-Costa D. et al, Visual Performance of a multifocal toric soft contact lens. Optom. Vis Sci. Nov 2012;89(11):1627-1635.

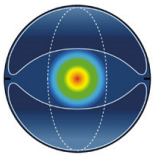
Visual Performance of MF Toric SCL

- Results:
  - **Performance of MV and MF within 1-2 letters**
  - Note:
    - 60% of subjects:
      - < 50 yo
      - Near add lower than +1.50
    - Astigmatic error in study population?

Madrid-Costa D. et al, Visual Performance of a multifocal toric soft contact lens. Optom. Vis Sci. Nov 2012;89(11):1627-1635.

Soft Toric Fitting Tips

- #1. Fix astigmatism correction first
  - Then employ multifocal fitting strategies
- #2. Order 3 diagnostics per eye
  - on spectacle axis and either side
    - What axes?



Initial Diagnostic Axes

- Assume 0.75DC of residual cylinder and above is unacceptable
- How much axis mislocation of a given toric power will induce this level of residual astigmatism?
  - 30° mislocation: Residual cyl = toric power in lens
    - Eg. -2.25 DC lens misaligns 30° = 2.25DC residual
      -2.25 DC lens misaligns 10° = 2.25/3= 0.75DC residual
- Spectacle Rx: –1.00-2.25x090
  - Order axes: 090, 080, 100

Toric Lens Power (D)	Degrees of Lens Rotation Inducing 0.75D* of Residual Astigmatism
0.75	30
1.25	18
1.75	12
2.25	10
2.75	8
3.25	7
3.75	6
4.25	5
4.75	4.5
5.25	4
5.75	3.5

Quinn TG and Brown WL, Fast Tracking Soft Toric Multifocal Fitting, Contact Lens Spectrum, 33(3): March 2018

What do we fit?

- The Decision Drivers
  - Astigmatic error
  - What are they used to?
    - Are they happy?

What do we fit?

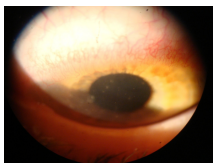
- The Decision Drivers
  - Astigmatic error
  - What are they used to?
    - Are they happy?
  - Safety and Convenience

Presbyopes & Daily Disposables

- Great for part-time wear
- Convenience
- Presbyopes have dry eye issues
  - Dry eyes lead to lens coating
    - Dirty lenses are responsible for many contact lens problems

Contact Lens Safety

- Incidence of CIEs:
  - **DD vs Reusable:**
    - *12.5 X less likely with DD*[1]
  - **DD SiHy vs DD Hyd:**
    - SiHy DD: 0.4%
    - Hyd DD: 0%



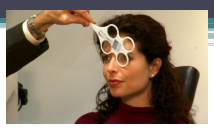
1.Chalmers, Robin L. et al, **Multicenter Case-Control Study of the Role of Lens Materials and Care Products on the Development of Corneal Infiltrates**, *Optometry & Vision Science*. 89(3):316-325, March 2012.

2. Chalmers RL et al, **Rates of Adverse Events With Hydrogel and Silicone Hydrogel Daily Disposable Lenses in a Large Post Market Surveillance Registry: The TEMPO Registry.** *Invest Ophthalmol Vis Sci.* 2015 Jan 8;56(1):654-63

Tips for Fitting Simultaneous Vision Designs

- Corneal GP Multifocals
- Soft Multifocals
- Hybrid Multifocals
- Scleral Multifocals

Examination Procedures and Techniques



Assessing Performance

- Scouting report
  - Open-ended questioning
- Real world environment
  - Lights up
  - Binocular conditions
  - Real world tasks
  - Loose lenses

B.A.- Secretary

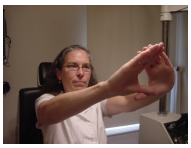
- 47 yo, w, f
- Newly fit by another provider with DD MF
  - Blur at distance and near, esp. distance
- Reports wore a monthly replacement MF successfully before developing GPC

B.A.- Secretary

- Spectacle Rx
  - +4.00 DS +1.75 add
  - +3.50 DS +1.75 add
- CL Specs (DD MF center near asphere)
  - +4.50 Low
  - +4.50 High
- The Problem?
  - B.M. dominance testing
    - Sensory: OS
    - Sighting: OS

Lens Selection

- Determine eye dominance
  - Sighting dominance
  - Sensory dominance



Science says…

- Pointer J, J of Optom, (2012) 5, 52-55
  - Method:
    - 72 Emmetropes
      - Sighting method: hole in the card
      - Sensory method: +1.50 blur test
  - Results:
    - Right eye dominance
      - Sighting method: 71%
      - Sensory method: 54%
      - Laterality was in agreement only 50% of the time!

Science says…

- Sighting Dominance
  - Little to no relationship with success with monovision [1,2]
- Sensory Dominance
  - Evidence suggests may be a better measure [3,4]

1. Shor C, Landsman L, Erickson P, Ocular dominance and the interocular suppression of blur in monovision, Am J Optom Physiol Opt. 1987 Oct; 64(10):723-30.
2. Erickson P, McGill EC. Role of visual acuity, stereoacuity, and ocular dominance in monovision patient success. Optom Vis Sci. 1992 Oct;69(10):761-4.
3. Robboy MW, Cox IG, Erickson P, Effects of sighting and sensory dominance on monovsion hight and low contrast visual acuity, CLAO J. 1990 Oct-Dec; 16(4):299-301
4. Collins MJ, Goode A, Interocular blur suppression and monovision, Acta Ophthalmol (Copenh) 1994; 72(3):376-80.

M.M.- Physician

- 62 yo, w, m
- D/C GP MF due to dryness assoc. w/ RA
- Current Tx: Restasis, Omega 3, eyelid cleanser
- Interested in DD MF

M.M.- Physician

- Keratometry: OD: 43.25/43.75 @ 098 OS: 44.00/43.50@121
- Spectacle Rx: OD: -3.75 -0.25 x 170 OS: -4.75 -0.75 x 100
  +2.50 add +2.50 add
- OD dominant (sighting;sensory?)

- DD Options:
  - 1st attempt: MF OU → blur at near
    - Push plus non-dominant OS: blur persists
  - 2nd attempt: MF OD, SV toric OS set for near → blur at intermediate
  - 3rd attempt: MF OD, SV toric OS set for intermediate → blur at near
  - 4th attempt: MF OD biased near, SV toric OS for distance
    - **BINGO!**

Blur Tolerance Test

- Line up patient behind phoropter with best corrected Rx
- Both eyes open through the entire procedure
- Instruct patient to report when they first detect blur
- Introduce plus in +0.25 D steps until the patient reports blur
- Reset phoropter to best corrected Rx
- Repeat adding plus to the other eye until patient reports blur
- Calculate difference between findings for right and left eyes

Quinn TG, The Blur Tolerance Test, Contact Lens Spectrum, 34(3), March 2019

M.M.- Physician

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  - 4th attempt: MF OD biased near, SV toric OS for distance
    - **BINGO!**

Plus to blur:
OD +0.75, OS +0.75

B.A.- Secretary

- Spectacle Rx
  - +4.00 DS +1.75 add
  - +3.50 DS +1.75 add
- CL Specs (DD MF center near asphere)
  - +4.50 Low
  - +4.50 High
- The Problem?
  - B.M. dominance testing
    - Sighting: OS
    - Sensory: OS

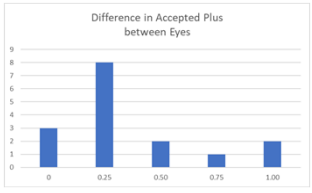
Plus to blur:
OD +1.50, OS +0.50

Blur Tolerance Test

Thomas Quinn, OD, MS
Shane Foster, OD
Rachel LeFebvre, OD
Heather Van Law, OD

N=16 subjects

67% agreement between sensory and sighting dominance



Quinn TG, The Blur Tolerance Test, Contact Lens Spectrum, 34(3), March 2019

Assessing Performance

- 20/40 line
- Text based near tasks
- Don't recheck too soon
- Don't make changes too soon

Adaptation to Multifocal Optics

- Sheedy et al, Optom Vis Sci, June 1993
  - Noted significant improvement in complex task performance with concentric bifocal lenses
  - No improvement with monovision
- Pappas et al, Eye Contact Lens, May 2009
  - Assess performance of 88 subjects at dispensing and after 4 days of wear
  - *"Early assessment is relatively unrepresentative of performance later on during multifocal contact lens wear."*
- Fernandes et al, Optom Vis Sci, Mar 2013
  - Over 15 days, MF acuity at D and N ***improved***
  - MV acuity remained the same or worsened

Parting Words

- "The visual system needs time to adapt"
- "Light is your friend"
- "These lenses are designed to work together"

Enhancing Performance

- 1: Always start with OR using loose lenses
  - To confirm distance Rx
- 2: Follow the manufacturer's guide!

When is enough…enough.

- You've set the right tone
  - The Sandwich Approach
- You've confirmed the Rx
  - Always confirm distance Rx first
- You've shared **The 3 Revelations**
  - "The goal is to meet most of your needs most of the time"
  - "You may need to give up a little bit of crispness for freedom"
  - "This is as good as it gets"

Many Thanks!

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Tgquinn5@gmail.com