Intro To Soft Contacts

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Financial Disclosure Statement

Andrew Bruce provides consulting services for . . .

- VSP Optics/UUniversity
- Mitsui Chemicals

- All relevant relationships have been mitigated
- He has NO financial interest in any product presented in this course.

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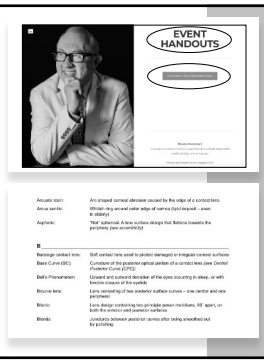
Event Handouts

"Contact Lens Terminology"



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Course Objectives

1. Present the basics of soft contact lens technology
2. Explore the visual, cosmetic, and convenience benefits soft contacts provide your patients
3. Discuss soft lens fitting basics together with ways to prepare your contact lens patients for success.

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Let's Start At The Very Beginning . . .

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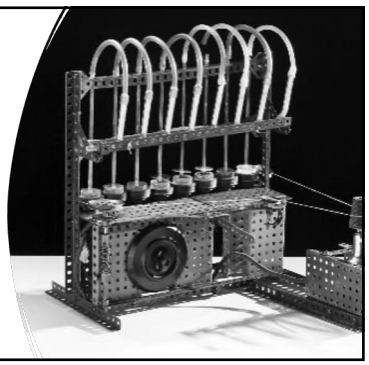
Evolution of Soft Lenses



- Dr. Otto Wichterle
- Water-based “hydrogel”
- HEMA
- 1971 FDA approval.

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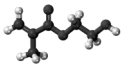
Hydroxyethyl Methacrylate



- Hydrophilic
- Water content directly proportional to Dk/t
- To increase Dk/t = Increase water content
- Results in increased in hydrophilic properties.

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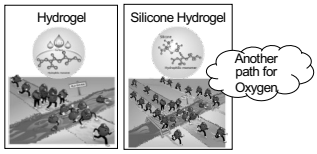
Silicone Hydrogel



- Silicone facilitates increased oxygen transmission, hydrogel transports fluid
- Allows for increased oxygen transmission without increasing hydrophilic properties
- Improved wearer comfort and ocular health
- Facilitates extended wear.

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Soft Lens FDA Groups

Group	Water Content	Ionic / Non-Ionic Polymer
1	Low < 50%	Non
2	High > 50%	Non
3	Low < 50%	Ionic
4	High > 50%	Ionic

FDA created Group 5 for Silicone Hydrogel

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Key Terminology

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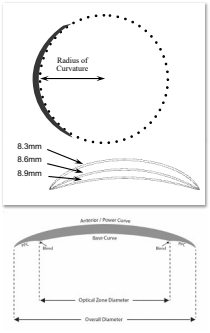
Lens Parameters

- Base Curve / Radius of Curvature
- Overall Diameter
- Optical Zone



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Dk vs. Dk/t

- **D:** Diffusion
- **k:** Solubility
- **Dk:** Oxygen permeability
- **DK/t:** Oxygen transmissibility

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Modulus

Measure of Lens Rigidity

- High modulus = more rigid
- Low modulus = less rigid

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Modality

Lens Replacement Regimen

- Daily disposable
- Two-week planned replacement
- Monthly planned replacement
- Etc.

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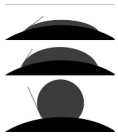
Surface Wettability



- Indicates how well tears spread across lens
- Determined by a material's wetting angle
- What does the wetting angle tell us?
- With contacts, low wetting angle preferred.

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Benefits of Soft Contacts

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Convenience Benefits

- Ideal for sports and outdoor wear
- Vision unimpaired by rain or fogging up
- Non-prescription sunglasses can be worn
- Allow patients with high powers to wear wrapped eyewear
- Daily disposable contacts make things even easier!

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Cosmetic Benefits

- Invisible form of vision correction
- Enhanced self-image and self-confidence.

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Visual Benefits

- Expanded field of clear vision
- Improved binocular fusion
- Magnification control
- Enhanced depth perception, eye-hand coordination.

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Fitting Basics

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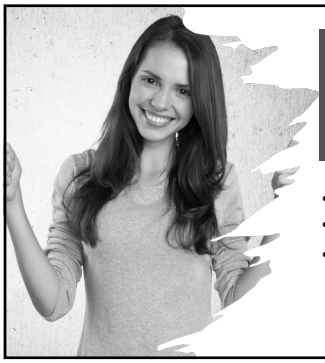

Best Suited Patients For Soft Contacts

- High refractive errors
- Anisometropia / antimetropia
- Astigmats with > 0.50D cyl

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Contraindications For Soft Contacts

- Amblyopes / Monocular Patients
- Prescribed prism
- Health issues such as diabetes

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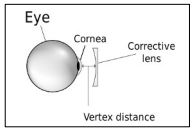
Vertex Corrected Powers



- Increase VD = increase in plus power
- Decrease VD = decrease in plus power

Compensation required over +/- 4D with contacts

$$\text{Effective Power} = \frac{\text{Original Power}}{1 + (\text{change in VD (m)} \times \text{Original Power})}$$

NOTE: If VD ↑ change is "-" If VD ↓ change is "+"

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Vertex Corrected Example

Q: What contact lens power should be selected if Rx determined at a VD of 12mm is +5.00DS?

Effective power at corneal plane = $\frac{\text{Original Power}}{1 + (\text{change in VD (m)} \times \text{Original Power})}$

= +5 / 1 + (+0.012 x +5) = +4.71D *(verify)*

Contact lens power selected to compensate = **+5.25D**

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Spherical Equivalent Power

Sphere Equivalent, SE = ½ cylinder + Sphere

Example

Rx: +5.00 -2.00 x 180

SE = (1/2 x -2.00) + (+5.00)

SE = **+4.00D**

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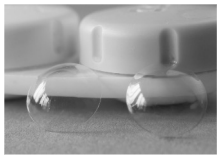
Lens Design Options



- Spherical
- Toric
- Aspheric Designs
- Multi-focal
  - Simultaneous Designs
  - Concentric
  - Monovision / Modified Monovision

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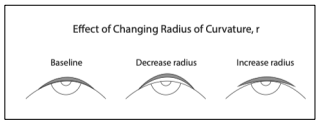
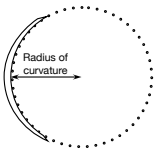
Base Curve Selection





- For soft contacts, select BC as close as possible to flat k
- Steeping BC "tightens" lens fit
- Flattening BC "loosens" lens fit

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Converting Corneal Curvature To Radius of Curvature

Ex: 44.50D to mm

- Rearranging for "r"
- r = n-1 / D
- r =1.3375 – 1 / 44.50 = 0.00758 meters = 7.58mm

Surface Power Formula

D = n-1 / r

D = Corneal curvature in Diopters
n = Refractive index of the pre-corneal tear film (1.3375)
r = Radius of curvature of cornea

To simplify:

- 337.5 / Diopters = Radius of curvature in mm
- 337.5 / Radius of curvature in mm = Curvature in Diopters

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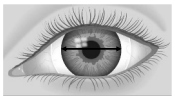
Lens Diameter Selection



- **HVID**: Horizontal Visible Iris Diameter used to determine lens diameter
- Soft lens diameter = HVID + 2mm

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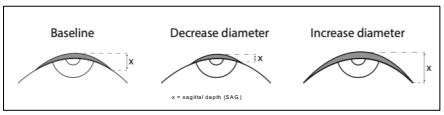
Effects of Changing Lens Diameter



- Influences sagittal depth (SAG)
- Decreasing diameter loosens the fit
- Increasing diameter tightens the fit

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Material Selection

HEMA

Silicone Hydrogel (SiHy)

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Modality Selection

- Dailies
- Weekly
- Bi-weekly
- Monthly
- Bi-monthly
- Extended Wear

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Modality Selection Considerations

- Lifestyle
- Vocation
- Hobbies
- Medical / ocular history
- Motivation

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Prepare Patients For Success

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Dos and Don'ts

Do…

- Sterilize case every week
- Replace case every 3 months
- Replace Lenses as Recommended
- Only use recommended care solutions
- Return to the office or call with any concerns or questions.

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Dos and Don'ts

Do Not . . .

- Sleep in non-FDA approved contacts
- Swim in contacts
- Hot tub in contacts
- Shower in contacts
- Use saliva to clean
- Wear for longer than recommended.

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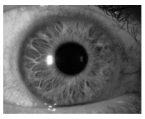
Educate Patients
Keep An Eye Open For . . .



- Redness
- Discharge
- Irregularities in Vision

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Educate Patients
Importance of Quality Sunglasses

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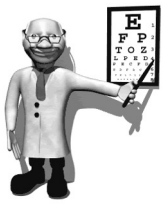
Education Patients
Importance of Annual Exams



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To Take Away . . .

- Soft contacts can expand your patient's world
- Discover their lifestyle needs to determine the most appropriate product to recommend
- Prepare them for success and a healthy contact lens wearing life – especially with pediatrics
- Make a difference and be proud!

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Thank You!

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