Contact Lens Basics

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Objectives

- History of Contact Lens development and technology
- What we treat with contact lenses
- Types of contact lenses
  - Soft
  - Rigid
  - Hybrid
  - Parameters of contact lenses

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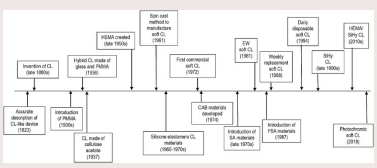
History of Contact Lenses

- 1508 the concept of contact lens was sketched by Leonardo De Vinci
- 1823 practical designs were created by Sir John Hershel
- 1887 first CL made from glass and fitted over the entire eye
- 1939 first plastic CL
- 1948 first plastic CL that covers only the cornea
- 1971 soft contact lens
- 1978 RGP
- 1981 overnight wear FDA approved
- 1996 daily disposable introduced
- 2002 Silicone hydrogel first marketed
- 2002 OrthK approved by FDA



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What we treat

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Refractive Error

- Myopia (nearsightedness)
- Hyperopia (farsightedness)
- Astigmatism
- Presbyopia (changes in accommodation

- When writing a prescription the

brand type , power , base curve and diameter is needed

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Corneal Traumas and Diseases

- Severe corneal abrasions
- Sterile corneal ulcers
- Keratoconus
- Corneal ectasia

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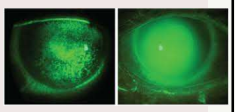
Ocular Surface Disease

- Scleral Lenses are being prescribed for the management of ocular surface disease.
- Protects the ocular surface and provides continuous hydration
- Cover the entire cornea and provides a fluid reservoir between the back of the lens and the front surface of the cornea
- Sjögren's syndrome - chronic auto in mine disease presenting with dry eyes and mouth
- Exposure keratopathy - results from eyelid malpostion
- Neurotrophic kertopathy - impaired corneal innervation and decreased con range sensitivity.



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Color Vision Deficiency

- Inherited condition with no cure
- Most commonly trouble seeing red and green or blue and yellow
- Glasses that block certain wavelengths of light and increase the ability to detect red and green
- New research on dyes to be added to contact lens and block th wavelengths that lies between red and gree

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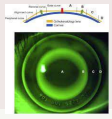
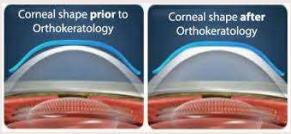
Orthokeratology

- Temporarily reshapes the cornea to improve vision
- Worn at night to reshape the cornea while you sleep
- Mainly used to correct and control myopia
- Rigid gas permeable lenses





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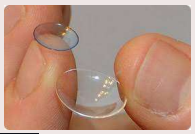
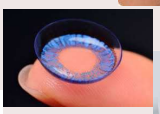
Soft Contact Lenses

- Made of polymers that absorb water
- Need to be kept in solution to keep from drying out
- Flexible and comfortable to wear
- Handling can be tricky
- Spherical correction
- Toric for astigmatism
- Mono vision or Multi-focal fit
- Color/ tinted

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Rigid Contact Lenses

Hard lenses

- Older material PMMA did not allow oxygen to flow through to the cornea.
  - Lack of oxygen caused retainment of water and swelling
- RGP's
  - Now made of polymers and plastics that are oxygen permeable
  - Last longer and provide sharper vision
- Scleral
  - Cover the entire corneal surface and rest on the sclera
- Care and Handling
  - Adaptation period
  - Tinted
  - Long life


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Hybrid Contact Lenses

- Best of both worlds- best visual acuity of RGP and comfort of soft lens
- Center RGP with soft skirt
- Great for corneal astigmatism
- Great for trouble with soft toric lens movement
- Multifocal

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Wear Schedule

- Daily Disposiabl- wear when awake and remove before bed
- Bi-weekly
- Monthly
- Quarterly
- Annual
- Extended Wear - continuous or overnight wear
  - 6 days to 30 days
  - Could increase risk of complication , need regular monitoring

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Care and Handling

- Medical devices
- Washing hands before handling
- Cleaning , rinsing and disinfecting
- Cleaner Removes debris from lens surface
- Rinse removes the cleaner and lossedn debris from the surface
- Storage case filled with disinfecting and conditioning solution
- Enzymatic cleaners may be added to reduce build of protein on the surface of the lens


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Parameters of contact lenses

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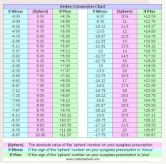
Lens Design and Power

- `Prescription of contact lens is different then spectacle because it fits on the eye and not information of the eyes
- This takes a account the vertex distance
- RGP are custom made
- Soft contacts are fit by parameters that are provided by the manufacturer



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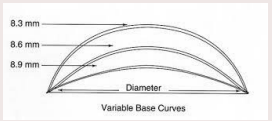
Base Curve Radius

- Primary curve on the posterior of the lens
- Approximate the shape of the cornea
- Millimeters of radius of curvature
- Measured by a radiuscope or keratometer



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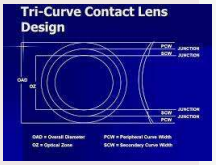
Overall Diameter and Optical Zone Diameter

- OAD is the size of the lens from edge to edge at the widest point
  - Rigid lens is 8.5mm to 9.5mm
  - Soft lens is 11mm to 15mm
- OZD
  - Center area that provides optical correction for the patient Vision
  - Differed depending on pupil size , the OAD and peripheral curve width



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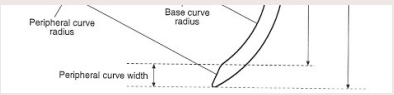
Peripheral Curves

- Additional curves on the back surface of th Elena that surround the optical zone to help tailor the lens to fit each patient
- Steeper in the center and flatter in the periphery
- Images that gradual slopping of the cornea



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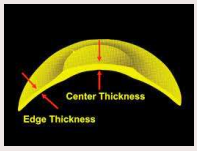
Edge and Center Thickness

- Center thickness : lens thickness of the center of the lens from posterior to anterior
  - The increased thickness of a lens reduces its oxygen permeability
  - Hyperopia prescription has a higher center thickness
- Edge thickness is the thickness of the edge of the lens
  - Important factor in the comfort of the lens, a thick edge can cause discomfort and irritation
  - Higher in myopia prescriptions



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