



IACLE Distance Learning Program (DLP)

Phase 1 Assignment 2:

Course content covered:

A4. Contact Lens Designs

A5. Contact Lens Fabrication

A6. Corneal Oxygenation in Contact Lens Wear

From the New IACLE Contact Lens Course (New ICLC)



ASSIGNMENT 2

Read the questions carefully and record your answers on the answer sheet template

1. In altering the fit of a SCL on the eye, which of the following statements is **NOT true**?
 - a. Increasing the CL's Total Diameter (TD) will decrease the sagittal height
 - b. Reducing the back optic zone radius (BOZR) will tighten the CL fit
 - c. Reducing the CL's TD will loosen the CL fit
 - d. Increasing the BOZR of the CL will decrease the sagittal height

2. When designing an RGP CL, how much flatter than the BOZR is the back peripheral radius (BPR) made typically?
 - a. 1.6 mm
 - b. 2.5 mm
 - c. 3.8 mm
 - d. 6.0 mm

3. Which of the following types of SCLs would **MOST** likely result in pervaporation staining of the cornea?
 - a. Thick, low water content CLs
 - b. Thick, high water content CLs
 - c. Thin, medium water content CLs
 - d. Thin, high water content CLs

4. In evaluating the fluorescein pattern of an alignment fitting RGP CL, approximately how wide should the edge clearance zone be ideally?
 - a. About 0.05 mm
 - b. 0.1 to 0.15 mm
 - c. 0.2 to 0.4 mm
 - d. 0.5 to 0.75 mm

5. What is the **MOST** important reason for wanting an RGP CL material to show good wettability?
 - a. Adequate oxygen permeability
 - b. Good optical regularity
 - c. Dimensional stability
 - d. Smooth CL movement

6. What is the desired amount of axial edge lift (AEL) of an alignment fitting RGP CL with a peripheral curve width of 0.30 – 0.50 mm?
 - a. 25 to 50 μm
 - b. 50 to 75 μm
 - c. 75 to 100 μm
 - d. 100 to 125 μm



- 7. Which one of the following RGP CL parameters is NOT affected when altering the Total Diameter (TD) of a CL?**
- Back optic zone radius (BOZR)
 - Axial edge lift
 - Peripheral curve width
 - Centre of gravity (CofG)
- 8. According to Holden and Mertz (1984), what should the average thickness of a 38% water daily wear CL be theoretically, to eliminate CL-induced daytime corneal oedema?**
- 0.009 mm
 - 0.023 mm
 - 0.033 mm
 - 0.046 mm
- 9. All of the following are true of aspheric RGP CLs compared with spherical RGP CLs, EXCEPT:**
- Better corneal alignment is achieved
 - More difficult to manufacture
 - Provide somewhat better vision
 - More difficult to verify
- 10. Which one of the following factors is likely have the LEAST effect on the flexure of an RGP CL on the eye?**
- Permeability of the CL material
 - CL thickness
 - Corneal toricity
 - Young's modulus of the CL material
- 11. In which of the following CL wear modalities is CL adherence MOST likely to occur?**
- SCL extended wear
 - RGP CL extended wear
 - SCL daily wear
 - RGP CL daily wear
- 12. Which statement regarding the Korb 'lid attachment' philosophy of RGP CL fitting is NOT true?**
- A modified front surface edge design provides a broader contact band with the upper eyelid
 - Typically a smaller overall diameter is used (range of 8.60 mm – 9.40 mm)
 - A thinner CL design is used to decrease CL mass
 - The CL is fitted steeper than usual



- 13. What is the MOST important reason for wanting a SCL to show adequate movement on the eye?**
- To increase the comfort of the CL on the eye
 - To improve oxygen transmission through the CL
 - To remove metabolic waste and debris from under the CL
 - To ensure adequate tear mixing with each blink
- 14. An RGP CL has a mid-peripheral zone that is flatter than the cornea meaning the CL design has excessive edge lift. Which of the following is MOST likely to occur?**
- Corneal indentation
 - Reduced CL movement
 - Minimal tear exchange with the blink
 - Poor centration
- 15. Which method of manufacture is normally used for low-volume production and custom-made SCLs?**
- Cast molding
 - Spin casting
 - Wet molding
 - Lathe cutting
- 16. Which statement regarding the assessment of the wettability of CL materials is NOT true?**
- In the sessile drop method, a large contact angle indicates poor wettability
 - In the Wilhelmy plate method, the receding angle is greater than the advancing angle
 - In the sessile drop method, the advancing angle is determined by adding more water
 - In the captive bubble method, air is introduced under a CL in a wet cell
- 17. Which statement regarding hydrogel SCLs is NOT true?**
- Higher water content materials have a lower refractive index than their low water content counterparts
 - A CL stored in a hypertonic solution will show a reduction in water content
 - The CL water content decreases as the pH of the surrounding medium becomes more alkaline
 - Thin low water content CLs are less likely to cause pervaporation staining than thin high water content CLs
- 18. The Dk value of a 40–55% water content hydrogel CL, measured through the coulometric technique at a temperature of 34°C, would be approximately:**
- 5 – 8
 - 7 – 19
 - 18 – 28
 - > 50



- 19. Which statement regarding Silicone Acrylate (SA) materials for RGP CL manufacture is NOT true?**
- Relatively 'hard' surfaces do not scratch as easily
 - Lower rigidity might cause flexure problems on the eye
 - More susceptible to surface 'burning' during manufacture
 - Surface charge and surface chemistry make them more deposit prone
- 20. Each of the following instruments can be used to measure the Total Diameter (TD) of a rigid gas permeable (RGP) CL, EXCEPT:**
- V-gauge
 - Radiuscope
 - Moiré fringe deflectometer
 - Magnification loupe
- 21. Ideally, which of the following should be done prior to RGP CL verification?**
- Hydrate the CL in distilled water for 4 – 6 hours
 - Clean and polish the CL's surfaces
 - Dry store the CL for 8 hours
 - Hydrate CL in a soaking solution for 12 – 24 hours
- 22. Which one of the following factors is an ADVANTAGE of RGP CLs over SCLs?**
- No foreign body (FB) sensation
 - Provide clear, sharp vision
 - Good for occasional wear
 - Daily disposability is an option
- 23. According to Holden and Mertz (1984), what level of oxygen is required under daily wear (DW) CLs to limit or prevent corneal oedema?**
- 5.7%
 - 9.9%
 - 13.4%
 - 17.9%
- 24. With each blink, the tear exchange capability of the 'tear pump' under a SCL is approximately:**
- 0.5%
 - 1%
 - 10%
 - 20 %



- 25. Which one of the following techniques is NOT a means of estimating corneal oxygen demand?**
- Clark-type polarographic oxygen sensor
 - Rate of epithelial cell mitosis
 - Confocal microscopy
 - Aesthesiometry
- 26. According to Harvitt and Bonanno (1999), to prevent anoxia across the entire cornea, the following CL transmissibilities (Dk/t) are required in the open and closed eye conditions respectively:**
- 9.9×10^{-9} and 17.9×10^{-9}
 - 23×10^{-9} and 89×10^{-9}
 - 24.1×10^{-9} and 87.0×10^{-9}
 - 35×10^{-9} and 125×10^{-9}
- 27. Regardless of water content, the overnight corneal swelling resulting from the wearing of a conventional hydrogel CLs during sleep is most likely to be:**
- 0.5 to 3%
 - 3 to 5%
 - 4 to 7.5%
 - 8 to 12%
- 28. The minimum corneal oxygen requirement to prevent the suppression of mitosis in the corneal epithelium is:**
- 5%
 - 9%
 - 13%
 - 20%
- 29. What temperature is typically used by manufacturers and researchers when calculating the oxygen permeability (Dk) of a CL material?**
- 18° C
 - 21° C
 - 34° C
 - 37° C
- 30. Which statement regarding the oxygen permeability of a CL material is INCORRECT?**
- Independent of CL thickness
 - Based on the diffusion (D) and solubility (k) coefficients of the material
 - Temperature dependent
 - Can be measured using the coulometric technique