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Mastering REFRACTIVE SURGERY

A Comprehensive MCQ Guide

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Foreword
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Section 1

Multiple choice questions

Questions:

1. Which of these statements does not accurately reflect the three stages of adaptation after corneal laser refractive surgery?

- **A** During the third stage, patients should never be given temporary spectacles as this can delay neuroadaptation
- **B** In the first few days after surgery, the patient should expect to experience significant night vision disturbances due to corneal oedema
- **C** In the first few weeks after surgery, the patient can expect the vision to fluctuate throughout the day and from day to day
- **D** You should expect the refraction to be slightly overcorrected in one day, meaning the vision might be slightly blurred until the healing and epithelial remodelling have finished

2. Select the best response:

- **A** Monovision can be associated with compromises of binocular visual function, decreased contrast sensitivity, and reduced stereopsis, as well as a risk of glare and night vision difficulties
- **B** In monovision, low contrast visual acuities are more affected in higher proportion in high illumination, and compromise increases if there is a residual astigmatic error in the near-corrected dominant eye
- **C** Interocular blur suppression is not dependent on the level of ambient illumination
- **D** The normal stereoacuity in a 40-year-old patient is approximately 160 arc seconds, and with monovision, it can reduce to up to 200 arc seconds

3. Regarding the use of mitomycin C (MMC) in photorefractive keratectomy (PRK), which statement is most likely to be true? MMC is used in a concentration of:

- **A** 2%
- **B** 2.2%
- **C** 0.2%
- **D** 0.02%

4. What best describes anisometropia?

- **A** An inter-eye spherical equivalent difference of >1 D
- **B** An inter-eye spherical equivalent difference of >1.5 D
- **C** An inter-eye meridional difference of >1 D
- **D** An inter-eye meridional difference of >1.5 D

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5. Which of the following statements about a corneal abrasion during flap creation with a femtosecond laser is most likely to be false?

A It can cause diffuse lamellar keratitis (DLK)
B It can give rise to epithelial ingrowth
C It can cause delayed healing
D It is of no consequence and cannot cause any complications

6. Which preoperative testing is required prior to phakic intraocular lens (IOL), IOL implantation but is unnecessary in patients considering laser-assisted in situ keratomileusis (LASIK)?

A Tear film break-up time
B Anterior chamber depth measurements
C Corneal topography
D Worth 4-dot test

7. Which of the following statements best describes a grade III presentation of DLK?

A *Mild:* Sectoral or localised infiltrates
B *Moderate:* Diffuse collection of white macrophages covering the central and peripheral interface
C *Severe:* Stromal melting, permanent scarring, and central hyperopic shift
D *Significant:* A large number of white blood cells congregate in clumps in the central visual axis. If left untreated, there is a high risk of stromal melting and scarring

8. Which treatment regarding the excimer laser refractive surgery is most likely to be true? Excimer lasers in laser vision correction emit energy at a wavelength of:

A 103 nm
B 193 nm
C 1,093 nm
D 1,923 nm

9. Corneal topography showed a well-defined inferior hotspot without posterior changes. The most common cause is:

A Corneal ectasia
B Contact lens wear
C Postkeratoplasty
D Corneal scar

10. Excimer lasers currently used in laser refractive surgery use which of the following gases?

A Argon and helium
B Argon and fluorine
C Fluorine and carbon dioxide
D Helium and nitrogen

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11. Select the best response:

- **A** The contrast sensitivity function increases when the stimulus is viewed binocularly rather than monocularly, which is approximately 42% greater than monocular contrast sensitivity
- **B** With increasing monocular defocus, the binocular contrast sensitivity decreases steadily but never falls below monocular contrast sensitivity
- **C** On further increasing the defocus beyond +3.5 D of defocus, the binocular contrast sensitivity reverts to the monocular level, indicating suppression of the defocused eye
- **D** Monovision affects peripheral vision and visual fields, but since it is not used in our day-to-day activities, it does not affect the monovision outcomes

12. Which one of the following statements is true about the incidence of epithelial ingrowth after corneal laser refractive surgery?

- **A** The incidence of epithelial ingrowth after a flap lift retreatment is higher for femtosecond laser flaps than for mechanical microkeratome flaps
- **B** The incidence of epithelial ingrowth after primary LASIK is higher for femtosecond laser flaps than for mechanical microkeratome flaps
- **C** The incidence of epithelial ingrowth after small incision lung extraction (SMILE) is higher than after LASIK
- **D** The incidence of epithelial ingrowth is higher after primary LASIK than after flap lift retreatments

13. Which of the following statements related to femtosecond lasers is most likely to be correct? Femtosecond laser is:

- **A** An infrared laser
- **B** Ultraviolet laser
- **C** Blue light laser
- **D** Ultrared laser

14. An optical device measured the IOL, but the three measurements were not valid due to different unrepeatable K readings. The best thing to do is:

- **A** Take the average measurement and proceed with cataract surgery
- **B** Put lubricant in the clinic and repeat the measurements after 10 minutes
- **C** Measure K reading by another device and input them in the optical device
- **D** Treat with lubricants for at least 1 week before repeating the measurements

15. Which one of the following works best for minimising microfolds after LASIK?

- **A** After replacing the flap, irrigate for a long period using a multiport LASIK cannula
- **B** Aim to leave the flap with a small gutter around the edges
- **C** Evaluate the flap positioning using heavy fluorescein staining immediately after surgery and make any necessary adjustments using a dry sponge
- **D** If microfolds are identified on day one, perform a flap lift procedure, including scraping of the epithelium overlying the folds

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16. Which of the following is the least likely to cause a refractive surprise after cataract surgery?

A Controlled diabetes
B Ocular surface disease
C Ectatic corneal disease
D Previous corneal surgery

17. A toric lens was implanted in cataract surgery to correct 3 D of corneal astigmatism. Postoperative, refraction showed 1.5 D of astigmatism. The toric lens is expected to be off-axis by:

A 10°
B 15°
C 20°
D 25°

18. Which of the following is the correct order of interfaces for the femtosecond cutting in lenticule extraction laser procedures?

A Lenticule interface, cap interface, lenticule side cut, small incision
B Lenticule interface, lenticule side cut, cap interface, small incision
C Lenticule side cut, small incision, cap interface, lenticule interface
D Small incision, cap interface, lenticule side cut, lenticule interface

19. On corneal tomography of a case with pellucid marginal degeneration (PMD), it is uncommon to find:

A Bell sign on thickness map
B Crab claw on anterior curvature map
C Abnormal posterior elevation
D Quick descending slope on the spatial profile

20. Select the best response:

A A large angle alpha and a small pupil are beneficial to improve the function of multifocal IOLs, especially for distance vision
B A photopic pupil of more than 3.2 mm is more likely to give good-quality distance and near vision in asymmetric multifocal IOLs than a pupil of less than 2.5 mm
C Irregular corneal astigmatism is not very relevant in newer-generation trifocal lenses
D Newer-generation trifocal lenses are less affected by macular pathologies

21. Which one of the following is false with regard to lenticule extraction laser procedures?

A They cannot be used for low myopia less than –2.50 D
B They are currently approved for compound myopic astigmatism
C They are not currently approved for hyperopia
D They are currently approved for myopia

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22. Which of the following statements regarding the use of ethanol in laser-assisted subepithelial keratectomy (LASEK) is most likely to be correct? Ethanol is used in concentrations of:

A 28%
B 50%
C 18%
D 35%

23. On corneal tomography of a case with pellucid-like keratoconus (PLK), the following is not found:

A The inverted slope on the spatial profile
B Crab claw on anterior curvature map
C Abnormal posterior elevation
D Abnormal anterior elevation

24. What preoperative test is most crucial for determining the available strategies for astigmatism correction in evaluating a patient for a refractive lens exchange?

A Manual keratometry
B Simulated keratometry from an autorefractor or topographer
C Corneal tomography
D Scheimpflug measurement of lenticular astigmatism

25. On corneal tomography of a case with keratoglobus, the following is not found:

A A quick slope on the spatial profile
B Abnormal anterior elevation
C Bell sign on thickness map
D Generalised steepening on the curvature map

26. Regarding lens-based surgery, preoperative keratometry K1 is 44@ 92, and K2 is 46@2. A standard intraocular lens is selected with a target of –0.25, and a temporal clear corneal incision is made. What would be the expected refractive outcome assuming the incision is astigmatically neutral?

A –0.25/+2.00 × 2
B –0.25/+2.00 × 92
C –1.25/+2.00 × 2
D –1.25/+2.00 × 92

27. Which statement regarding the type of corneal collagen in the human cornea is most likely to be true? The corneal stroma contains collagen:

A Type 1
B Type 2
C Type 3
D Type 4

28. On corneal tomography of a case with a diseased thick cornea, the most characteristic sign is:

A Abnormal anterior elevation
B Anterior hotspot on curvature map

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C Epithelial thinning on epithelial mapping
D A flat corneal thickness slope on the spatial profile

29. After removing the lenticule, which one of the following is the next step in the lenticule extraction laser procedure?

A Distend the lenticule on the corneal surface to check its integrity and confirm it is complete
B Instill steroid drops into the interface to avoid postoperative diffuse lamellar keratitis
C Irrigate the interface with BSS to be sure no debris is left in the interface
D Remove the speculum

30. Which of the following examinations is most likely to suggest dry eyes?

A A Schirmer test result showing 14 mm in 1 minute
B Tear film break-up time (TBUT) 3 seconds
C Tear meniscus 2 mm
D Phenol red thread test 10 mm

31. Long use of soft contact lenses shows up on corneal tomography as:

A Hotspot due to epithelial hypertrophy
B Hotspot due to epithelial thinning
C Hotspot due to abnormal posterior elevation
D Flat spot due to epithelial thinning

32. In relation to corneal crosslinking, which of the following answers is most likely to be correct? The vitamin used to soak the cornea in corneal crosslinking is:

A Vitamin C
B Riboflavin (vitamin B_2)
C Vitamin E
D Vitamin A

33. In which of these situations is it imperative that you abort the lenticule extraction laser procedure and switch to another procedure?

A Suction loss occurs during the first 10% of the lenticule interface
B Suction loss occurs during the creation of the small incision
C The small incision is torn during lenticule separation
D Central bubble pattern in the lenticule interface

34. A 36-year-old patient who is a high myope wearing –14 D in the right eye and –15 D in the left eye with plus 1.25 cylinder in both eyes has a stable prescription. Dilated fundus examination is within normal limits, and central corneal thickness measures 552 μm with a good reasonable anterior chamber depth of 3.2 mm. He wishes to be spectacle-independent.

Which of the following is least likely to be considered if the aim is for emmetropia and total spectacle independence?

A Spherical vision posterior phakic IOL (PIOL) followed by an excimer laser for the remaining refractive error

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B Phakic toric iris fixated anterior chamber IOL alone
C Toric posterior PIOL alone
D Refractive lens exchange and toric intraocular lens

35. On corneal tomography of a case with a focal corneal scar, it is most likely to find:

A Flat thin area
B Flat thick area
C Steep thin area
D Steep thick area

36. Which of the following drops should be routinely prescribed after LASIK?

A Broad-spectrum antibiotics and nonsteroidal drops
B Broad-spectrum antibiotic drops only
C Steroid drops only
D Broad-spectrum antibiotics and steroid drops

37. Which one of the following statements is true about using low energy for the lenticule extraction laser procedure?

A The optimal energy level is 100 nJ (laser setting 20)
B There is less the opaque bubble layer (OBL) when using lower energy
C Using lower energy results in a rougher lenticule surface
D Lower energy causes more postoperative corneal oedema

38. During the tomography capture, the patient was not fixating properly. To detect this misalignment on tomography, the X and Y coordinates of the pupil centre were compared in both eyes.

Which of the following best describes the misalignment:

A X–X >200 μm
B Y–Y >200 μm
C X+Y >200 μm
D X–Y >200 μm

39. During the LASIK procedure, the surgeon noticed corneal epithelial fragility.

In the preoperative workup, the surgeon failed to ask about:

A Blood hypertension
B Glaucoma
C Dry eyes
D Diabetes

40. Which of the following is false with regard to the lenticule extraction laser procedure?

A Immobilising the eye with fine-toothed forceps enables counterforce to be applied against the movement of the separator instrument
B Rotating the Sinskey tip can be used as a rescue manoeuvre to find the cap interface
C Separating the lenticule interface first is deemed as a surgical complication
D The lenticule can be removed using a forceps or using the separator bulb

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Mastering Refractive Surgery
A Comprehensive MCQ Guide

A solid foundation built on reliable resources is essential to practicing successful refractive surgery. One effective method to consolidate knowledge in this field is through self-assessment using multiple choice questions (MCQs). Prior to the release of this book, locating refractive surgery MCQs was a daunting challenge. This book is the first resource offering MCQs specifically designed to prepare for refractive surgery examinations. The book offers a comprehensive overview of various topics, including preoperative candidate assessment, laser-based refractive surgery, lens-based refractive surgery, complications of refractive surgery, and ethical principles related to good medical practice in this field. We believe this book constitutes a paradigm shift in this field by highlighting important practical points. It also serves as the foundation for a future question bank.



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