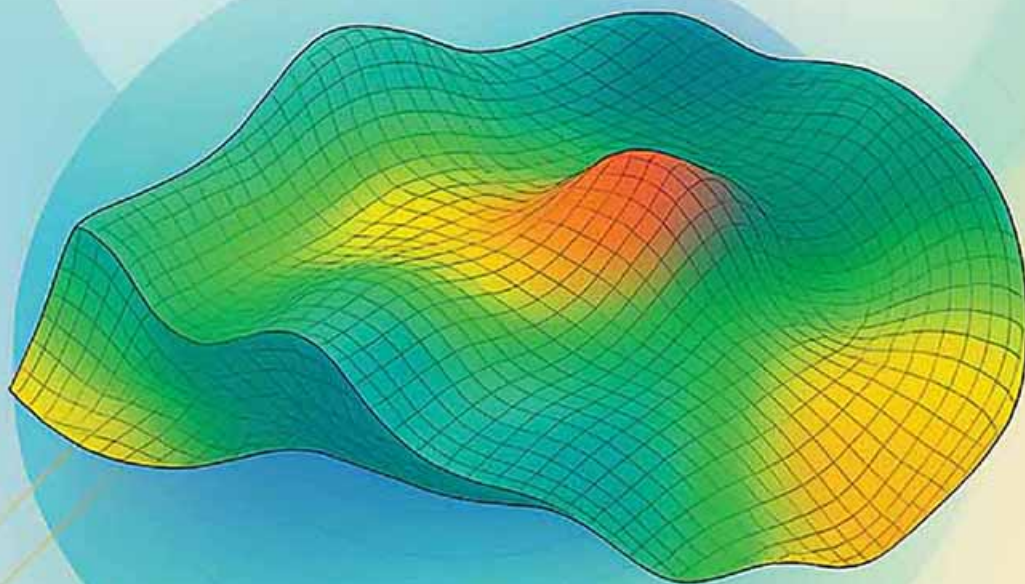


Vol. 2



Corneal Tomography in Clinical Practice

Self-Assessment: MCQs
& Clinical Cases



Mazen M Sinjab

5th Edition

CORNEAL TOMOGRAPHY IN CLINICAL PRACTICE

Self-Assessment: MCQs & Clinical Cases

FIFTH EDITION

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Part 1

Multiple choice questions (MCQs)

QUESTIONS

Chapter 1: Corneal optics and geometry

1. The angle kappa is defined as the angle between:
 - A. Optical axis and visual axis
 - B. Line of sight and pupillary axis
 - C. Achromatic axis and vertex keratoscope normal
 - D. Pupillary axis and visual axis
2. Regarding the normal human cornea, which statement accurately describes its anatomical and refractive properties?
 - A. The cornea is a perfect sphere, providing uniform refractive power across its surface
 - B. The posterior corneal surface acts as a positive convex lens with a power of approximately +6 D
 - C. The vertical corneal diameter is typically larger than the horizontal corneal diameter
 - D. The cornea is thinner centrally and progressively flattens from the center towards the periphery
3. What is the primary effect of the corneal epithelium on the underlying corneal shape and irregularities?
 - A. It consistently makes the cornea more prolate, irrespective of underlying irregularities
 - B. It forms a positive lens after myopic ablation and a negative lens after hyperopic correction
 - C. It significantly increases the overall astigmatism of the cornea by approximately 0.75 D
 - D. It has no measurable impact on corneal power or the masking of stromal irregularities
4. The refractive power of the posterior corneal surface is approximately:
 - A. +49 D
 - B. +19.11 D
 - C. -6 D
 - D. +15 D
5. The mean Q-value of the cornea is typically more prolate in which of the following states?
 - A. With the corneal epithelium intact
 - B. Without the corneal epithelium
 - C. After hyperopic laser ablation
 - D. In the central 3 mm zone of the cornea

Chapter 2: Measuring corneal geometry

6. Which of the following best describes the primary distinction between corneal topography and tomography?
 - A. Topography measures corneal thickness, while tomography measures only surface curvature
 - B. Topography evaluates the posterior corneal surface, whereas tomography focuses on the anterior
 - C. Topography utilizes elevation-based devices, and tomography employs curvature-based instruments
 - D. Topography analyzes the anterior corneal surface curvature, while tomography provides data from both corneal surfaces and thickness mapping
7. A patient presents with suspected peripheral keratoconus. Which type of device would be least effective for initial detection of this condition?
 - A. Slit-scanning tomographer
 - B. Scheimpflug-based tomographer
 - C. Placido-based topographer
 - D. OCT-based tomographer
8. In cases of significant stromal haze or scarring, which corneal imaging modality is considered superior for accurate total corneal power measurement?
 - A. Placido-based topography due to its reflection-based principle
 - B. OCT-based tomography, due to its less affected by stromal haze and scarring
 - C. Scheimpflug-based tomography, as it provides both anterior and posterior surface data
 - D. Keratometry, given its focus on the central corneal area
9. Which of the following is a direct measurement obtained by Placido-based topographers?
 - A. Anterior corneal surface curvature
 - B. Posterior corneal elevation
 - C. Corneal thickness profiles
 - D. Epithelial thickness mapping
10. The ability of a Scheimpflug-based device to achieve a maximal depth of focus with minimal image distortion is attributed to what principle?
 - A. Ray tracing technology
 - B. The Scheimpflug principle

- C. The reflection of Placido mires
- D. Utilization of white, flash slit-lights

Chapter 3: Screening guidelines

11. A technician is preparing a patient for Pentacam HR imaging. The patient has been using soft contact lenses daily. According to international guidelines for obtaining good-quality captures, what is the minimum recommended duration for contact lens cessation before the visit?
 - A. 24 hours
 - B. 3 days
 - C. 1 week
 - D. 2 months
12. A Pentacam HR image shows black-dotted areas on the full diameter map. Upon switching to the 9-mm magnified display, these black-dotted areas persist. What is the clinical implication of this finding?
 - A. The image quality is acceptable for interpretation
 - B. The cornea has normal peripheral thinning
 - C. This indicates early pellucid marginal degeneration
 - D. The capture is likely an artifact and cannot be accepted for analysis
13. To avoid over- and underestimation of corneal irregularities on curvature maps, what are the recommended color scale increments for the sagittal and tangential maps, respectively?
 - A. 0.25 D for sagittal, 0.5 D for tangential
 - B. 0.5 D for sagittal, 1.0 D for tangential
 - C. 1 D for sagittal, 1.5 D for tangential
 - D. 1.5 D for sagittal, 2.0 D for tangential

Chapter 4: Overview

14. In the four-composite refractive map, what does a 'white OK' for the quality specification (Qs) indicate?
 - A. Missing information that was extrapolated
 - B. Poor quality of the tomographic capture
 - C. Good quality of the tomographic capture with no missing information
 - D. Misalignment during capture
15. What is the main reason why the Sim-Ks of the posterior corneal surface are displayed in negative values?
 - A. It is a convex refractive surface
 - B. The incident light passes from a medium of higher refractive index (stroma = 1.375) to a medium of lower refractive index (aqueous humor = 1.336)
 - C. The incident light passes from a medium of lower refractive index to a medium of higher refractive index
 - D. It accounts for corneal astigmatism

16. What is the recommended minimum internal anterior chamber depth (ACD Int) for Phakic IOL implantation, as recommended by the FDA?
 - A. ≥ 3.0 mm
 - B. < 2.1 mm
 - C. < 100 mm³
 - D. $\geq 35^\circ$

Chapter 5: Corneal power maps

17. A patient underwent a keratorefractive procedure in the past. When measuring corneal power, the autorefractometer is now generating inaccurate readings. This is primarily due to changes in what corneal factor after refractive surgery?
 - A. Spherical aberration
 - B. The Gullstrand ratio (posterior/anterior radii ratio)
 - C. The refractive index of the tear film
 - D. The horizontal white-to-white diameter
18. Which corneal power map is considered most useful for studying the features of corneal irregularities and the contour of the ablated zone after laser-based refractive surgery, and is less affected by misalignment?
 - A. Anterior sagittal (axial) curvature map
 - b. Anterior tangential (local or instantaneous) curvature map
 - C. Refractive power map
 - D. True net power map
19. A surgeon is evaluating a patient with suspected early ectatic corneal disease. Which corneal power map, when studied with the Smolek/Klyce color scale and in 'mm' display, is specifically highlighted as important for early detection of such diseases because changes on it may precede those on the posterior elevation map?
 - A. Posterior sagittal curvature map
 - b. Posterior elevation map
 - C. Posterior tangential curvature map
 - D. Posterior equivalent K-reading power map
20. The total corneal refractive power (TCRP) map is described as the truest possible representation of the power of the nonoperated cornea. This is because it includes:
 - A. The refractive effect and true refractive index
 - B. Both corneal surfaces and corneal thickness
 - C. The refractive effect, inclusion of both surfaces, true refractive index, and location of principal planes
 - D. The keratometric refractive index and standard Gaussian optics
21. When evaluating the pattern of the anterior sagittal curvature map, what does a 'significant segmentation' of the steep and flat semimeridians suggest?
 - A. Suitability for toric IOL implantation

Corneal Tomography in Clinical Practice

Self-Assessment: MCQs & Clinical Cases

This landmark 5th edition of *Corneal Tomography in Clinical Practice* is presented in two comprehensive volumes, offering a unique and unparalleled resource in the field of anterior segment imaging.

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- The updated Sinjab PS3 Algorithm for Subjective Tomographic Scoring
- The updated Sinjab PSIS Algorithm for personalized IOL selection

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