


High-quality vision correction: Spherical aberration and the pupil are the keys


1. Spherical aberration (SA) is part of what higher radial order of vision?
 - a. second order
 - b. third order
 - c. fourth order
 - d. fifth order
2. Which of the following technologies is not used to measure or correct spherical aberrations?
 - a. lenslet arrays
 - b. ocular coherence tomography
 - c. Diffraction gratings
 - d. pixilated optics, nanotechnologies
3. Which higher order aberration has the highest incidence and prevalence in human vision?
 - a. spherical aberration
 - b. coma
 - c. trefoil
 - d. piston
4. A steeper peripheral curve in relationship to its central or apical curve defines what type of refracting surface?
 - a. aspheric
 - b. convex
 - c. oblate
 - d. prolate
5. A miotic pupil reduces or eliminates:
 - a. no higher order aberrations
 - b. all higher order aberrations
 - c. third order aberrations
 - d. fourth order aberrations
6. With every 1-mm increase in pupil diameter above a 5-mm pupil, spherical aberrations will increase by what percentage?
 - a. 25%
 - b. 50%
 - c. 75%
 - d. 100%
7. In an aphakic eye, what is the critical measure of spherical aberrations?
 - a. the crystalline lens
 - b. the vitreous
 - c. the cornea
 - d. the tear film
8. The light rays producing positive spherical aberrations cross where?
 - a. behind the retina
 - b. on the retina
 - c. in front of the retina
 - d. parallel rays
9. Negative spherical aberrations do what to the circle of least confusion?
 - a. reduce its size
 - b. increase its size
 - c. have no effect on it
 - d. distort it
10. Negative spherical aberrations are more commonly generated in:
 - a. emmetropes
 - b. astigmats
 - c. hyperopes
 - d. myopes
11. Positive spherical aberrations increase with all of the following except:
 - a. pupil dilation
 - b. pupil constriction
 - c. hyperopia
 - d. increased spherical correction
12. Which higher order aberration has the most profound effect on contrast sensitivity?
 - a. coma
 - b. trefoil
 - c. spherical aberration
 - d. quadrefoil
13. Contrast sensitivity is measured by:
 - a. root mean square (RMS)
 - b. point spread function (PSF)
 - c. modular transfer function (MTF)
 - d. higher order aberrations (HOAs)
14. Spherical aberrations have their most profound clinical effect on what type of vision?
 - a. scotopic
 - b. photopic
 - c. peripheral
 - d. best corrected vision
15. All of the following factors contribute to spherical aberrations in human vision except:
 - a. biological factors
 - b. chemical factors
 - c. optical factors
 - d. aging of the crystalline lens
16. What type of optical lens can best address the effects of spherical aberrations?
 - a. concave lens
 - b. convex lens
 - c. tinted lens
 - d. aspheric lens
17. At what RMS level will a person become clinically aware (clinical awareness threshold) of their higher order aberrations?
 - a. 0.1 μ
 - b. 0.2 μ
 - c. 0.4 μ
 - d. 0.8 μ
18. Which of the following terms is not being used commercially to describe higher order correction?
 - a. high definition correction
 - b. supervision
 - c. customized correction
 - d. personalized correction
19. What is the ophthalmic industry's greatest obstacle in higher order correction?
 - a. mass-manufacturing lenses
 - b. integrating higher order technologies into lenses
 - c. measuring higher order aberrations
 - d. marketing the concept of higher order vision
20. Which of the following vision correcting modalities is not currently available to correct spherical aberrations?
 - a. spectacles
 - b. contact lenses
 - c. intraocular lenses
 - d. cortical correction

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