

REFERENCES

- 1] Duke-Elder S. System of Ophthalmology, Vol V, Ophthalmic Optics. St. Louis, the C.V. Mosby Company, 1970.
- 2] Pepose JS. The Cornea. In: Adler's Physiology of the eye: Clinical application. Hart WM, Ed., 9th edition, St. Louis, The CV Mosby 1992,
- 3] Martola A, Baum C. Central and peripheral corneal thickness. Arch Ophthalmol. 1968.
- 4] Boettner EA, Wolter JR. Transmission of the ocular media. Invest Ophthalm. 1962.
- 5] Klyce SD, Beuerman RW. Structure and function of the cornea. In Cornea: Kaufman HF, Barron BA, McDonald MB, Eds., 2nd edition, Butterworth-Heinemann. Boston 1998.
- 6] Pitts DG. The human ultraviolet action spectrum. Am J Optom Arch Am Acad Optom. 1974.
- 7] Bergmanson JPG. Corneal damage in photokeratitis – why is it so painful? Optom Vis Sci. 1990.
- 8] Maurice DM. The structure and transparency of the cornea. J Physiol. 1957.
- 9] Trinkaus-Randall V, Edelhauser HF, Leibowitz HM, Freddo TF. Corneal disorders. Clinical diagnosis and management. Leibowitz HM, Waring GO III, Eds, 2nd edition, WB Saunders, Philadelphia, 1998.
- 10] Pavan-Langston D. Manual of ocular diagnosis and Therapy. Little Brown and company, 1991.
- 11] Apple DJ, Rabb MF. Ocular pathology: Clinical applications and self assessment. St. Louis: Mosby Inc., 1998
- 12] Fincham EF. The mechanism of accommodation. Br J Ophthalmol. 1937.
- 13] Araki M, Tokoro T, Matsuo C. Movement of the ciliary body associated to accommodation. Acta ophthalmol Jpn. 1964.

- 14] Sebag J. The Vitreous. In: Adler's Physiology of the eye: Clinical application. Hart WM, Ed., 9th edition, St. Louis, The CV Mosby 1992.
- 15] Fisher RF. Is the vitreous necessary for accommodation in man? Br J Ophthalmol. 1983.
- 16] Beauchamp R, Mitchell B. Ultrasound measures of vitreous chamber depth during ocular accommodation. Am J Optom Physiol. 1985.
- 17] Pandey SK, Thakur J, Werner L, et al. The Human Crystalline Lens, Ciliary Body and Zonules: Their Relevance to Presbyopia. In: Agarwal A, ed., Presbyopia: A Surgical Text. Slack Inc., Thorofare, NJ, USA 2002.
- 18] Assia EI, Castaneda VE, Legler UFC, et al. Studies on cataract surgery and intraocular lenses at the Center for Intraocular Lens Research. Ophthalm Clin North Am. 1991.
- 19] Pandey SK, Werner L, Apple DJ. Posterior capsule opacification: Etiopathogenesis, clinical manifestations, and management. In: Garg A, Pandey SK, eds., Textbook of Ocular Therapeutics. Jaypee Brothers. 2002.
- 20] Atchison DA, Smith G. Optics of the Human Eye. Oxford: Butterworth-Heinemann; 2000.
- 21] Bennett AG, Rabbetts RB. Clinical Visual Optics. 2nd ed. London: Butterworths; 1989.
- 22] Charman WN. Optics of the human eye. In: Cronly-Dillon J, ed. Visual Optics and Instrumentation. Boca Raton, Fla: CRC Press Inc; 1991:1-26.
- 23] Roorda A. Human visual system: image formation. In: Hornack JP, ed. Encyclopedia of Imaging Science and Technology. New York: Wiley & Sons; 2002:539-557.
- 24] Sommerfeld A. Zur mathematischen theorie der Beugungserscheinungen. Nachr Kgl Acad Wiss Gottingen. 1894; 4:338-342.
- 25] Applegate RA, Marsack J, Ramos R. Interaction between aberrations can improve or reduce visual performance. J Cataract Refract Surg. 2003; 29(8):1487-1495.

References

- 26] Applegate RA, Lakshminarayanan V. Parametric representation of Stiles-Crawford functions: normal variation of peak location and directionality. *J Opt Soc Am A*. 1993; 10:1611-1623.
- 27] Goodman JW. Introduction to Fourier optics. New York: McGraw-Hill; 1968.
- 28] Thibos LN. Formation and sampling of the retinal image. In: De Valois K, editor. *Seeing handbook of perception and cognition*. London: Academic Press; 2000.
- 29] Yariv A. Optical Electronics. 3rd ed. New York, NY: Holt, Rinehart and Winston; 1985.
- 30] Trokel SL, Srinivasan R, Braren B. Excimer laser surgery of the cornea. *Am J Ophthalmol*. 1983; 96(6):710-715.
- 31] Puliafito CA, Stern D, Krueger RR, Mandel ER. High-speed photography of excimer laser ablation of the cornea. *Arch Ophthalmol*. 1987; 105(9):1255-1259.
- 32] Noack J, Tonnie R, Hohla K, et al. Influence of ablation plume dynamics on the formation of central islands in excimer laser photorefractive keratectomy. *Ophthalmology*. 1997; 104(5):823-830.
- 33] Krueger RR, Trokel SL, Schubert HD. Interaction of ultraviolet laser light with the cornea. *Invest Ophthalmol Vis Sci*. 1985; 26(11):1455-1464.
- 34] Kitai MS, Popkov VL, Semchishen VA, Kharizov AA. The physics of UV laser cornea ablation. *IEEE J Quant Electron*. 1991; 27:302-307.
- 35] Krueger RR, Trokel SL. Quantitation of corneal ablation by ultraviolet laser light. *Arch Ophthalmol*. 1985; 103(11):1741-1742.
- 36] Salmon TO, West RW, Gasser W, Kenmore T. Measurement of refractive errors in young myopes using the COAS Shack-Hartmann aberrometer. *Optom Vis Sci*. 2003; 80:6– 14.
- 37] Howland HC, Howland B. The history and methods of wavefront sensing. *J Refract Surg*. 2000; 16(5):552– 3.

- 38] Mierdel P, Wiegard W, Krinke HE, et al. Measuring device for determining monochromatic aberrations of the human eye. *Ophthalmologe*. 1997; 6:441– 5.
- 39] Smirnov HS. Measurement of the wave aberration in the human eye. *Biophys*. 1961; 6:52– 66.
- 40] Campbell CE. A New Method for Describing the Aberrations of the Eye Using Zernike Polynomials. *Optom Vis Sci*. 2003.
- 41] Schwiegerling J. Theoretical limits to visual performance. *Surv Ophthalmol*. 2000.
- 42] Applegate RA. Limits to vision: can we do better than nature? *J Refract Surg*. 2000; 16:5547-5551.
- 43] Moreno-Barriuso E, Merayo-Loves J, Marcos S, et al. Ocular aberrations before and after myopic corneal refractive surgery: LASIK-induced changes measured with Laser Ray Tracing. *Invest Ophthalmol Vis Sci*. 2001; 42:1396-1403.
- 44] Campbell MCW, Harrison EM, Simonet P. Psychophysical measurement of the blur on the retina due to optical aberrations of the eye. *Vision Res*. 1990; 30:1587-1602.
- 45] Liang J, Grimm B, Goelz S, Bille JF. Objective measurement of wave aberrations of the human eye with the use of a Hartmann-Shack wavefront sensor. *J Opt Soc Am A*. 1994; 11:1949-1957.
- 46] Chalita MR, Kreuger RR. Correlation of aberrations to visual acuity. *Ophthalmol Clin N Am*. 2004; 14: 135-142.
- 47] Simonet P, Campbell MCW. The optical transverse chromatic aberration on the fovea of the human eye. *Vision Res*. 1990; 30:187-206.
- 48] Thibos LN, Bradley A, Still DL, et al. Theory and measurement of ocular chromatic aberration. *Vision Res*. 1990; 30:33- 49.
- 49] Rynders MC, Lidkea BA, Chisholm WJ, Thibos LN. Statistical distribution of foveal transverse chromatic aberration, pupil centration, and angle psi in a population of young adult eyes. *J Opt Soc Am A*. 1995; 12:2348-2357.

References

- 50] Thibos LN, Bradley A, Zhang XX. Effect of ocular chromatic aberration on monocular visual performance. *Optom Vis Sci.* 1991; 68:599- 607.
- 51] Thibos LN, Bradley A. Chromatic aberrations and its impact on vision. In: MacRae SM, Krueger, RR, Applegate RA, eds. *Customized Corneal Ablation: The Quest for Super Vision II.* Thorofare, NJ: SLACK Incorporated; 2004.
- 52] Winn B, Bradley A, Strang NC, et al. Reversals of the colour-depth illusion explained by ocular chromatic aberration. *Vision Res.* 1995; 35:2675-2684.
- 53] Thibos LN, Hong X, Bradley A, Cheng X. Statistical variation of aberration structure and image quality in a normal population of healthy eyes. *J Opt Soc Am A.* 2002; 19:2329-2348.
- 54] Applegate RA, Howland HC. Refractive surgery, optical aberrations, and visual performance. *J Refract Surg.* 1997; 13:295-299.
- 55] Thibos LN, Hong X. Clinical applications of the Shack-Hartmann aberrometer. *Optom Vis Sci.* 1999; 76:817-825.
- 56] Scheiner C. *Oculus, sive fundamentum opticum.* Inn-spruk; 1619.
- 57] Wade N. *A natural history of vision.* Cambridge (MA): MIT Press; 1998.
- 58] Thibos LN, Applegate R. Assessment of optical quality. In: MacRae SM, Krueger RR, Applegate RA, editors. *Customized corneal ablation: the quest for super vision.* Thorofare (NJ): Slack; 2001.
- 59] O'Shea DC, editor. *Introduction to wavefront sensors*, vol. TT18. Bellingham (WA): SPIE Optical Engineering Press; 1995.
- 60] Smirnov MS. Measurement of the wave aberration of the human eye. *Biofizika.* 1961.
- 61] Webb RH, Penney CM, Thompson KP. Measurement of ocular wavefront distortion with a spatially resolved refractometer. *Appl Opt.* 1992; 31:3678–3686.

- 62] He JC, Marcos S, Webb RH, Burns SA. Measurement of the wavefront aberration of the eye by a fast psychophysical procedure. *J Opt Soc Am A Opt Image Sci Vis.* 1998; 15:2449–2456.
- 63] Hartmann J. Bemerkungen über den Bau und die Justirung von Spektographen. *Zeitschrift für Instrumentenbau.* 1900.
- 64] Baba N, Kuwamura S, Miura N, Norimoto Y. Toward high-resolution imaging with a simple adaptive-optics system. *Opt Lett.* 1996.
- 65] Miller D, Williams DR, Morris GM, Liang J. Images of cone photoreceptors in the living human eye. *Vision Res.* 1996; 36:1067–79.
- 66] Durrie DS, Stahl ED. Comparing wavefront devices. In: Krueger RR, Applegate RA, MacRae SM, editors. *Wavefront customized visual correction: the quest for super-vision II.* Thorofare (NJ): Slack; 2004.
- 67] Wang L, Wang N, Koch DD. Evaluation of refractive error measurements of the WaveScan wavefront system and Tracey wavefront aberrometer. *J Cataract Refract Surg.* 2003.
- 68] Pettit GH, Campin JA, McDonald MB, Krueger RR. Customized ablation using the Alcon Custom Cornea platform. In: Krueger RR, Applegate RA, MacRae SM, editors. *Wavefront customized visual correction: the quest for super-vision II.* Thorofare (NJ): Slack; 2004.
- 69] Reinstein DZ, Neal DR, Vogelsang H, et al. Customized corneal ablation using the Carl Zeiss Meditec platform: CRS-Master, WASCA, TOSCA, MEL70 and MEL 80 excimer lasers. In: Krueger RR, Applegate RA, MacRae SM, editors. *Wavefront customized visual correction: the quest for super-vision II.* Thorofare (NJ): Slack; 2004.
- 70] Tscherning M. Die monochromatischen aberrationen des menschlichen Auges. *Z Psychol Physiol Sinne.* 1894.
- 71] Howland HC, Howland B. A subjective method for the measurement of monochromatic aberrations of the eye. *J Opt Soc Am A.* 1977; 67:1805–1818.
- 72] Mrochen M, Kaemmerer M, Mierdel P, et al. Principles of Tscherning aberrometry. *J Refract Surg.* 2000; 16:570–571.

References

- 73] Molebny VV, Pallikaris IG, Naoumidis LP, et al. Retinal ray tracing technique for eye refraction mapping. *Proc SPIE*. 1997; 2971:175-183.
- 74] Mierdel P, Kaemmerer M, Mrochen M, et al. Ocular optical aberrometer for clinical use. *J Biomed Opt*. 2001; 6:200-204.
- 75] Molebny VV, Panagopoulou S, Molebny SV, et al. Principles of ray tracing aberrometry. *J Refract Surg* 2000; 16 (5):572-575.
- 76] Wang L, Misra M, Pallikaris IG, Koch DD. A comparison of ray-tracing refractometer, autorefractor, and computerized videokeratography in measuring pseudophakic eyes. *J Cataract Refract Surg*. 2002; 28:276– 82.
- 77] Webb RH, Penney CM, Sobiech J, et al. SSR (spatially resolved refractometer): a null-seeking aberrometer. *Appl Opt*. 2003.
- 78] MacRae S, Fujieda M. Slit skiascopic-guided ablation using the Nidek laser. *J Refract Surg*. 2000; 16:S576-S580.
- 79] Roorda A. A review of Basic Wavefront Optics. In: Krueger RR, Applegate RA, MacRae SM, editors. *Wavefront customized visual correction: the quest for super-vision II*. Thorofare (NJ): Slack; 2004.
- 80] Solomon KD, Ferná'ndez de Castro LE, Sandoval HP, Vroman DT. Comparison of Wavefront Sensing Devices. *Ophthalmol Clin N Am*. 2004; 17: 119-127.
- 81] Curcio CA, Sloan KR, Kalina RE, Hendrickson AE. Human photoreceptor topography. *J Comp Neurol*. 1990; 292:497-523.
- 82] Stiles WS, Crawford BH. The luminous efficiency of rays entering the eye pupil at different points. *Proc R Soc Lond B Biol Sci*. 1933; 112:428-450.
- 83] Atchison DA, Scott DH, Strang NC, Artal P. Influence of Stiles-Crawford apodization on visual acuity. *J Opt Soc Am A*. 2002; 19:1073-1083.
- 84] Donnelly WJ 3rd, Roorda A. Optimal pupil size in the human eye for axial resolution. *J Opt Soc Am A Opt Image Sci Vis*. 2003.
- 85] Tutt R, Bradley A, Begley C, Thibos LN. Optical and visual impact of tear break-up in human eyes. *Invest Ophthalmol Vis Sci*. 2000; 41:4117-4123.

- 86] Rieger G. The importance of the precorneal tear film for the quality of optical imaging. *Br J Ophthalmol*. 1992; 76(3):157– 158.
- 87] Koh S, Maeda N, Kuroda T, et al. Effect of tear film break-up on higher-order aberrations measured with wavefront sensor. *Am J Ophthalmol*. 2002; 134(1):115-117.
- 88] Maeda N. Wavefront technology in ophthalmology. *Curr Opin Ophthalmol*. 2001.
- 89] Liang J, Westheimer G. Evaluating diffusion of the eye by objective means. *Invest Ophthalmol Vis Sci*. 1994; 35:2652-2657.
- 90] Panagopoulou SI, Plainis S, MacRae SM, Pallikaris I. The implications of pupil size and accommodation dynamics on customized wavefront-guided refractive surgery. In: Krueger RR, Applegate RA, MacRae SM, editors. *Wavefront customized visual correction: the quest for super-vision II*. Thorofare (NJ): Slack; 2004.
- 91] Charman WN, Atchison DA, Scott DH. Theoretical analysis of peripheral imaging after excimer laser corneal refractive surgery for myopia. *J Cataract Refract Surg*. 2002; 28:2017-2025.
- 92] Koomen M, Tousey R, Scolnic R. The spherical aberration of the eye. *J Opt Soc Am A*. 1949; 39(5):370-376.
- 93] Ivanoff A. About the spherical aberration of the eye. *JOSA*. 1956; 46:901-903.
- 94] Lu C, Munger R, Campbell MC. Monochromatic aberrations in accommodated eyes. In: *Technical Digest Series, Ophthalmic and Visual Optics*. 1993; 3:160-163.
- 95] Atchison DA, Collins MJ, Wildsoet CF, et al. Measurement of monochromatic ocular aberrations of human eyes as a function of accommodation by the Howland aberroscope technique. *Vision Res*. 1995; 35:313-323.
- 96] He JC, Burns SA, Marcos S. Monochromatic aberrations in the accommodated human eye. *Vision Res*. 2000; 40:41-48.

References

- 97] Stark LR, Atchison DA. Pupil size, mean accommodation response and the fluctuations of accommodation. *Ophthalmic Physiol Opt.* 1997; 17:316-323.
- 98] Hofer H, Artal P, Singer B, et al. Dynamics of the eye's wave aberration. *J Opt Soc Am A.* 2001; 18:497-506.
- 99] Kirwan C, O'keefe M, Soeldner H. Higher Order Aberrations in Children. *Am J Ophthalmol.* 2006; 141:67-70.
- 100] Brunette I, Bueno JM, Parent M, et al. Monochromatic aberrations as a function of age, from childhood to advanced age. *Invest Ophthalmol Vis Sci.* 2003; 44:5438–5446.
- 101] He JC, Sun P, Held R, et al. Wavefront aberrations in eyes of emmetropic and moderately myopic school children and young adults. *Vision Res.* 2002; 42:1063–1070.
- 102] Carkeet A, Leo SW, Khoo BK, Au Eong KG. Modulation transfer functions in children: pupil size dependence and meridional anisotropy. *Invest Ophthalmol Vis Sci.* 2003; 44:3248–3256.
- 103] Elliott D, Whitaker D, MacVeigh D. Neural contribution to spatiotemporal contrast sensitivity decline in healthy aging eyes. *Vision Res.* 1990; 30:541-547.
- 104] Glasser A, Campbell M. Biometric, optical and physical changes in the isolated human crystalline lens with age in relation to presbyopia. *Vision Res.* 1999; 39:1991-2015.
- 105] Barbero S, Marcos S, Llorente L. Optical changes in corneal and internal optics with cataract surgery. *Association for Research in Vision and Ophthalmology.* 2002; 73.
- 106] Marcos S. Are changes in ocular aberrations with age a significant problem for refractive surgery? *J Refract Surg.* 2002; 18(5):572-578.
- 107] Mclellan J, Marcos S, Burns S. Age-related changes in monochromatic wave aberrations in the human eye. *Invest Ophthalmol Vis Sci.* 2001; 42:1390-1395.

- 108] Calver R, Cox M, Elliott D. Effect of aging on the monochromatic aberrations of the human eye. *J Opt Soc Am A*. 1999; 16:2069-2078.
- 109] Brunette I, Parent M, Hamam H. Monochromatic Optical Aberration as a function of Age. Association for Research in Vision and Ophthalmology. 2002.
- 110] Smith G, Cox M, Calver R, Garner L. The spherical aberration of the crystalline lens of the human eye. *Vision Res*. 2001; 15:235-243.
- 111] Artal P, Berrio E, Guirao A, Piers P. Optical aberration and the aging eye. *Int Ophthalmol Clin*. 2003; 19:137-143.
- 112] Lorente L, Diaz-Santana L, Lara-Saucedo D, Marcos S. Aberrations of the human eye in visible and near infrared illumination. *Optom Vis Sci*. 2003; 80:26-35.
- 113] Marcos S, Burns SA, Moreno-Barriuso E, Navarro R. A new approach to the study of ocular chromatic aberrations. *Vision Res*. 1999; 39:4309-4323.
- 114] Hayashi K, Hayashi H, Hayashi F. Topographic analysis of the changes in corneal shape due to aging. *Cornea*. 1995; 14:527-532.
- 115] Oshika T, Klyce SD, Applegate RA, Howland HC. Changes in corneal wavefront aberrations with aging. *Invest Ophthalmol Vis Sci*. 1999; 40:1351-1355.
- 116] Guirao A, Redondo M, Artal P. Optical aberrations of the human cornea as a function of age. *J Opt Soc Am A*. 2000; 17:1697-1702.
- 117] Artal P, Guirao A, Berrio E, Williams DR. Compensation of corneal aberrations by the internal optics in the human eye. *Journal of Vision*. 2001; 1:1-8.
- 118] Brown N. The change in lens curvature with age. *Exp Eye Res*. 1974.
- 119] Korte J, Cook C, Kaufman P. Aging of the human lens: changes in lens shape at zero-diopter accommodation. *J Opt Soc Am A*. 2001; 18:265-272.
- 120] Saunders H. Age-dependence of the human refractive errors. *Ophthalmol*. 1981.

References

- 121] Smith G, Atchison D, Pierscioneck B. Modeling the power of the aging human eye. *J Opt Soc Am A*. 1992; 9:2111-2117.
- 122] Dubbelman M, Heijde V. The shape of the aging human lens: curvature, equivalent refractive index and the lens paradox. *Vision Res*. 2001; 41:1867-1877.
- 123] Pierscioneck B. Refractive index contours in the human lens. *Exp Eye Res*. 1997.
- 124] Moffat B, Atchison D, Pope J. Age-related changes in refractive index distribution and power of the human lens as measured by magnetic resonance micro-imaging in vitro. *Vision Res*. 2002; 1683-1693.
- 125] Marcos S, Barbero S, Llorente L. The sources of optical aberrations in myopic eyes. *Association for Research in Vision and Ophthalmology*. 2002 ; 417:174-176.
- 126] Marcos S, Barbero B, Llorente L, Merayo-Llodes J. Optical response to LASIK for myopia from total and corneal aberrations. *Invest Ophthalmol Vis Sci*. 2001; 42:3349-3356.
- 127] Jspeert JK, de Waard PW, van den Berg TJ, de Jong PT. The intraocular straylight function in 129 healthy volunteers: dependence on angle age and pigmentation. *Vision Res*. 1990; 30:699-707.
- 128] Hemenger R. Intraocular light scatter in normal vision loss with age. *Appl Opt*. 1984; 23:1972-1974.
- 129] Said F, Weale R. The variation with age of the spectral transmissivity of the living human crystalline lens. *Gerontologia*. 1959; 3:213-231.
- 130] Delori F, Burns S. Fundus reflectance and the measurement of crystalline lens density. *J Opt Soc Am A*. 1996; 13:215-226.
- 131] Artal P, Marcos S, Navarro R, et al. Through-focus image quality of eyes implanted with monofocal and multifocal intraocular lenses. *Optical Engineering*. 1995; 34:772-779.
- 132] Barbero S, Marcos S, Llorente L, Jimenez-Alfaro I. Optical aberrations of intraocular lenses measured in vivo and in vitro. *J Opt Soc Am A*. 2003; 20:1841-1851.

- 133] Holladay JT, Piers A, Koranyi G, et al. A new intraocular lens design to reduce spherical aberration of pseudophakic eyes. *J Refract Surg.* 2002; 18:683-691.
- 134] Atchison DA. Design of aspheric intraocular lenses. *Ophthal Physiol Opt.* 1991; 11:137-146.
- 135] Arden GB. The importance of measuring contrast sensitivity in cases of visual disturbance. *Br J Ophthalmol.* 1978; 62:198–209.
- 136] Sakata N, Tokunaga T, Miyata K, Oshika T. Changes in contrast sensitivity function and ocular higher-order aberration by conventional myopic photorefractive keratectomy. *Jpn J Ophthalmol.* 2007; 51:347–352.
- 137] Montés-Micó R, Charman WN. Mesopic contrast sensitivity function after excimer laser photorefractive keratectomy. *J Refract Surg.* 2002; 18:9–13.
- 138] Montés-Micó R, España E, Menezo JL. Mesopic contrast sensitivity function after laser in situ keratomileusis. *J Refract Surg.* 2003; 19:353–356.
- 139] Rocha KM, Soriano ES, Chalita MR, et al. Wavefront analysis and contrast sensitivity of aspheric and spherical intraocular lenses: a randomized prospective study. *Am J Ophthalmol.* 2006; 142:750–756.
- 140] Tzelikis PF, Akaishi L, Trindade FC, Boteon JE. Spherical aberration and contrast sensitivity in eyes implanted with aspheric and spherical intraocular lenses: a comparative study. *Am J Ophthalmol.* 2008; 33:1918–1924.
- 141] Yuko Ishii, Chikako Okamoto, Takahiro Hiraoka, et al. Mesopic Contrast Sensitivity and Ocular Higher-Order Aberrations in Eyes With Conventional Spherical Intraocular Lenses. *Am J Ophthalmol.* 2009; 148:298–302.
- 142] Brems RN, Apple DJ, Pfeffer BR, et al. Posterior chamber intraocular lenses in a series of 75 autopsy eyes: part III, correlation of positioning holes and optic edges with the pupillary aperture and visual axis. *J Cataract Refract Surg.* 1986.
- 143] Oshika T, Kawana K, Hiraoka T, et al. Ocular Higher-Order Wavefront Aberration Caused by Major Tilting Of Intraocular Lens. *Am J Ophthalmol.* 2005; 140: 744–746.

References

- 144] Kozaki J, Tanihara H, Yasuda A, Nagata M. Tilt and decentration of the implanted posterior chamber intraocular lens. *J Cataract Refract Surg.* 1991; 17:592–595.
- 145] Auran JD, Koester CJ, Donn A. In vivo measurement of posterior chamber intraocular lens decentration and tilt. *Arch Ophthalmol.* 1990; 108:75–79.
- 146] Taketani F, Matuura T, Yukawa E, Hara Y. Influence of intraocular lens tilt and decentration on wavefront aberrations. *J Cataract Refract Surg.* 2004; 30:2158–2162.
- 147] Bailey MD, Mitchell L, Dhaliwal DK, et al. Patient satisfaction and visual symptoms after laser in situ keratomileusis. *Ophthalmol Clin N Am.* 2003; 110:1371–1378.
- 148] Chalita M, Krueger R. Correlation of aberrations with visual symptoms post LASIK. *Ophthalmol Clin N Am.* 2004; 17:135-142.
- 149] Shimizu K, Amano S, Tanaka S. Photorefractive keratectomy for myopia: one-year follow-up in 97 eyes. *J Refract Corneal Surg.* 1994; 10(2 suppl):S178–187.
- 150] Tomidokoro A, Soya K, Miyata K, et al. Corneal irregular astigmatism and contrast sensitivity after photorefractive keratectomy. *Ophthalmology.* 2001; 108:2209–2212.
- 151] Tanabe T, Miyata K, Samejima T, et al. Influence of Wavefront Aberration and Corneal Subepithelial Haze on Low-contrast Visual Acuity After Photorefractive Keratectomy. *Am J Ophthalmol.* 2004; 138:620–624.
- 152] Oshika T, Klyce SD, El Danasoury MA, et al. Comparison of corneal wavefront aberrations after photorefractive keratectomy and laser in situ keratomileusis. *Am J Ophthalmol.* 1999; 127:1–7.
- 153] Melles GR, Kamminga N. Techniques for posterior lamellar keratoplasty through a scleral incision. *Ophthalmology.* 2003; 100:689–695.
- 154] Melles GR, Lander F, Beekhuis WH, et al. Posterior lamellar keratoplasty for a case of pseudophakic bullous keratopathy. *Am J Ophthalmol.* 1999; 127:340–341.

- 155] Price FW Jr, Price MO. Descemet's stripping with endothelial keratoplasty in 50 eyes: a refractive neutral corneal transplant. *J Refract Surg.* 2005; 21:339–345.
- 156] Patel SV, McLaren JW, Hodge DO, Baratz KH. Scattered light and visual function in a randomized trial of deep lamellar endothelial keratoplasty and penetrating keratoplasty. *Am J Ophthalmol.* 2008; 145:97–105.
- 157] Ousley PJ, Terry MA. Stability of vision, topography, and endothelial cell density from 1 year to 2 years after deep lamellar endothelial keratoplasty surgery. *Ophthalmology.* 2005; 112:50–57.
- 158] McLaren J, Patel S, Bourne W, Baratz K. Corneal Wavefront Errors 24 Months after Deep Lamellar Endothelial Keratoplasty and Penetrating Keratoplasty. *Am J Ophthalmol.* 2009; 147:959–965.
- 159] Musch DC, Meyer RF, Sugar A, Soong HK. Corneal astigmatism after penetrating keratoplasty. The role of suture technique. *Ophthalmology.* 1989; 96:698–703.
- 160] Busin M, Monks T, Al-Nawaiseh I. Different suturing techniques variously affect the regularity of postkeratoplasty astigmatism. *Ophthalmology.* 1998; 105:1200–1205.
- 161] Solano JM, Hodge DO, Bourne WM. Keratometric astigmatism after suture removal in penetrating keratoplasty: double running versus single running suture techniques. *Cornea.* 2003; 22:716–720.
- 162] Mader TH, Yuan R, Lynn MJ, et al. Changes in keratometric astigmatism after suture removal more than one year after penetrating keratoplasty. *Ophthalmology.* 1993; 100:119–126.
- 163] Maeda N, Fujikado T, Kuroda T, et al. Wavefront aberrations measured with Hartmann-Shack sensor in patients with keratoconus. *Ophthalmology.* 2002; 109:1996–2003.
- 164] Griffiths M, Zahner K, Collins M, Carney L. Masking of irregular corneal topography with contact lenses. *CLAO J.* 1998; 24:76–81.
- 165] Negishi K, Kumanomido T, Utsumi Y, Tsubota K. Effect of Higher-Order Aberrations on Visual Function in Keratoconic Eyes with a Rigid Gas Permeable Contact Lens. *Am J Ophthalmol.* 2007; 144:924–929.

References

- 166] Garcia-Lledo M, Feinbaum C, Alio JL. Contact lens fitting in keratoconus. *Compr Ophthalmol Update*. 2006; 7:47–52.
- 167] Zadnik K, Barr JT, Steger-May K, et al. Comparison of flat and steep rigid contact lens fitting methods in keratoconus. *Optom Vis Sci*. 2005; 82:1014–1021.
- 168] Alio J, El Kady B, Piñero D, et al. Refractive and Aberrometric Outcomes of Intracorneal Ring Segments for Keratoconus: Mechanical versus Femtosecond-assisted Procedures. *Am J Ophthalmol*. 2009; 116:1675–1687.
- 169] Rabinowitz Y, Li X, Ignacio T, Maguen E. INTACS inserts using the Femtosecond laser compared to using mechanical spreader in the treatment of keratoconus. *J Refract Surg*. 2006; 22:764–71.
- 170] Alio J, El Kady B, Piñero D, et al. Intracorneal Ring Segment Implantation in Corneas with Post-Laser In Situ Keratomileusis Keratectasia. *Am J Ophthalmol*. 2009; 116:1665–1674.
- 171] Seiler T, Kaemmerer M, Mierdel P, Krinke HE. Ocular optical aberrations after photorefractive keratectomy for myopia and myopic astigmatism. *Arch Ophthalmol*. 2000; 118:17–21.
- 172] Marco S. Aberrations and visual performance following standard laser vision correction. *J Refract Surg*. 2001.
- 173] Mrochen M, Krueger R, Bueeler M, Seiler T. Aberration sensing and wavefront-guided treatment: management of decentered ablations. *J Refract Surg*. 2002; 18:418–429.
- 174] Krueger R. Technology requirements for customized corneal ablation. In: MacRae SM, Krueger RR, Applegate RA, editors. *Wavefront customized visual correction: the quest for super-vision II*. Thorofare (NJ): Slack; 2004.
- 175] Huang D, Arif M. Spot size and quality of scanning laser correction of higher-order wavefront aberrations. *J Refract Surg*. 2001; 28:407–416.
- 176] Guirao A, Williams DR, MacRae SM. Effect of beam size on the expected benefit of customized laser refractive surgery. *J Refract Surg*. 2003; 19:15 – 23.

- 177] Beeler M, Mrochen M. Effect of eye-tracker latency on the correction of higher-order wavefront aberrations with scanning spot laser systems. *J Refract Surg.* 2004.
- 178] Thomas JW, Mitras S, Chuang AZ, Yee RW. Election microscopy of surface smoothness of porcine corneas and acrylic plates with four brands of excimer laser. *J Refract Surg.* 2003; 19:623–628.
- 179] Bollen E, Bax J, Van Dijk JG. Variability of the main sequence. *Invest Ophthalmol Vis Sci.* 1993; 34:3700–3704.
- 180] Huppertz M, Schmidt E, Teiwes W. Eye tracking and refractive surgery. In: MacRae SM, Krueger RR, Applegate RA, eds. *Customized Corneal Ablation: The Quest for Super Vision.* Thorofare, NJ: SLACK Incorporated; 2001.
- 181] O'Brien T. Six-month results of the multi-center wavefront LASIK trial using VISX. *ASCRS* 2002.
- 182] Mrochen M, Eldine MS, Kaemerrer M, et al. Improvement in photorefractive corneal laser surgery results using an active eye-tracking system. *J Cataract Refract Surg.* 2001; 27:1000–1006.
- 183] Mrochen M, Seiler T. Influence of corneal curvature on calculation of ablation patterns used in photorefractive laser surgery. *J Refract Surg.* 2001; 17:584– 587.
- 184] Dupps WJ, Roberts C. Effect of acute biomechanical changes on corneal curvature after photokeratectomy. *J Refract Surg.* 2001; 17:658– 659.
- 185] Seiler T, Dastjerdi MH. Customized corneal ablation. *Curr Opin Ophthalmol.* 2002; 13:256–260.
- 186] MacRae SM, Williams DR. Wavefront guided ablation. *Am J Ophthalmol.* 2001; 132:915– 919.
- 187] Huang D, Arif M. Spot size and quality of scanning laser correction of higher-order wavefront aberrations. *J Cataract Refract Surg.* 2002; 28:407– 416.
- 188] Bille JF. Preoperative simulation of outcomes using adaptive optics. *J Refract Surg.* 2000; 16:608 – 610.

References

- 189] Mrochen M, Kaemmerer M, Seiler T. Clinical results of wavefront-guided laser in situ keratomileusis 3 months after surgery. *J Cataract Refract Surg.* 2001; 27:201– 207.
- 190] Roberts C. Biomechanics of the cornea and wavefront guided laser refractive surgery. *J Refract Surg.* 2002; 18:589– 592.
- 191] Wilson SE, Netto M, Ambrosio Jr R. Corneal cells: chatty in development, homeostasis, wound healing, and disease. *Am J Ophthalmol.* 2003; 136:530– 536.
- 192] Wilson SE, Mohan RR, Mohan RR, et al. The corneal wound healing response: cytokine-mediated interaction of the epithelium, stroma, and inflammatory cells. *Prog Retin Eye Res.* 2001; 20:625–37.
- 193] Mohan RR, Mohan RR, Kim WJ, Wilson SE. Modulation of TNF-alpha-induced apoptosis in corneal fibroblasts by transcription factor NF-kb. *Invest Ophthalmol. Vis Sci.* 2000; 41:1327– 1336.
- 194] Wilson SE, KimWJ. Keratocyte apoptosis: implications on corneal wound healing, tissue organization, and disease. *Invest Ophthalmol Vis Sci.* 1998; 39:220– 226.
- 195] Mohan RR, Kim WJ, Mohan RR, et al. Bone morphogenic proteins 2 and 4 and their receptors in the adult human cornea. *Invest Ophthalmol Vis Sci.* 1998; 39:2626– 2636.
- 196] Wilson SE. Analysis of the keratocyte apoptosis, keratocyte proliferation, and myofibroblast transformation responses after photorefractive keratectomy and laser in situ keratomileusis. *Trans Am Ophthalmol Soc.* 2002; 100:411– 33.
- 197] O'Brien T, Li Q, Ashraf MF, et al. Inflammatory response in the early stages of wound healing after excimer laser keratectomy. *Arch Ophthalmol.* 1998; 116:1470– 1474.
- 198] Mohan RR, Hutcheon AE, Choi R, et al. Apoptosis, necrosis, proliferation, and myofibroblast generation in the stroma following LASIK and PRK. *Exp Eye Res.* 2003; 76:71–87.

- 199] Jester JV, Huang J, Petroll WM, Cavanagh HD. TGF beta induced myofibroblast differentiation of rabbit keratocytes requires synergistic TGFbeta, PDGF and integrin signaling. *Exp Eye Res.* 2002; 75:645–657.
- 200] Jester JV, Moller-Pedersen T, Huang J, et al. The cellular basis of corneal transparency: evidence for ‘corneal crystallins’. *J Cell Sci.* 1999; 112:613–622.
- 201] Schwiegerling J, Snyder RW, Lee JH. Wavefront and topography: keratome-induced corneal changes demonstrate that both are needed for custom ablation. *J Refract Surg.* 2002; 18:584 – 588.
- 202] Porter J, MacRae S, Yoon G, et al. Separate effects of the microkeratome incision and laser ablation on the eye’s wave aberration. *Am J Ophthalmol.* 2003; 136:327–337.
- 203] Kim JH, Sah WJ, Park CK, et al. Myopic regression after photorefractive keratectomy. *Ophthalmic Surg Lasers.* 1996; 27:435– 439.
- 204] Williams DK. Multizone photorefractive keratectomy for high and very high myopia: long-term results. *J Cataract Refract Surg.* 1997; 23:1034–41.
- 205] Ratkay-Traub I, Ferincz IE, Juhasz T, et al. First clinical results with the femtosecond neodymium-glass laser in refractive surgery. *J Refract Surg.* 2003; 19:94–103.
- 206] Liu X, Zou H, Slaughter C, Wang X. DFF, a heterodimeric protein that functions downstream of caspase-3 to trigger DNA fragmentation during apoptosis. *Cell.* 1997; 18:175–184.
- 207] Enari M, Sakahira H, Yokoyama H, et al. A caspase-activated DNase that degrades DNA during apoptosis, and its inhibitor ICAD. *Nature.* 1998; 1:43–50.
- 208] Jester JV, Barry-Lane PA, Petroll WM, et al. Inhibition of corneal fibrosis by topical application of blocking antibodies to TGF beta in the rabbit. *Cornea.* 1997; 16:177–187.
- 209] Thom SB, Myers JS, Rapuano CJ, et al. Effect of topical antitransforming growth factor-beta on corneal stromal haze after photorefractive keratectomy in rabbits. *J Cataract Refract Surg.* 1997; 23:1324– 1330.

References

- 210] Stechschulte SU, Jousen AM, von Recum HA, et al. Rapid ocular angiogenic control via naked DNA delivery to cornea. *Invest Ophthalmol Vis Sci*. 2001; 42:1975– 1979.
- 211] Kamata Y, Okuyama T, Kosuga M, et al. Adenovirus-mediated gene therapy for corneal clouding in mice with mucopolysaccharidosis type VII. *Mol Ther*. 2001; 4:307–312.
- 212] Cordeiro MF, Mead A, Ali RR, et al. Novel antisense oligonucleotides targeting TGF-beta inhibit in vivo scarring and improve surgical outcome. *Gene Ther*. 2003; 10:59– 71.
- 213] Mohan RR, Schultz GS, Hong JW, et al. Gene transfer into rabbit keratocytes using AAV and lipid-mediated plasmid DNA vectors with a lamellar flap for stromal access. *Exp Eye Res*. 2003; 76:373– 83.
- 214] Werner L, Apple DJ, Schmidbauer JM. Ideal IOL (PMMA and foldable) for year 2002. In: Buratto L, Werner L, Zanini M, Apple DJ, editors. *Phacoemulsification: principles and techniques*. 2nd edition. Thorofare (NJ): Slack; 2002.
- 215] Applegate RA, Thibos LN, Hilmantel G. Optics aberroscopy and supervision. *J Cataract Refract Surg*. 2001; 27:1093– 1107.
- 216] Norrby S. Conception of Z-sharp optic technology. Presented at the ASCRS Symposium on Cataract, IOL and Refractive Surgery. Philadelphia, 2002.
- 217] Artal P, Berrio E, Guirao A, Piers P. Contribution of the cornea and internal surfaces to the change of ocular aberrations with age. *J Opt Soc Am A Opt Image Sci Vis*. 2002; 19:137–43.
- 218] Bellucci R. Optical aberrations and intraocular lens design. In: Buratto L, Werner L, Zanini M, Apple DJ, editors. *Phacoemulsification: principles and techniques*. 2nd edition. Thorofare (NJ): Slack; 2002.
- 219] Werner L, Mamalis N. Wavefront Correction of Intraocular lens. *Ophthalmol Clin N Am* 17. 2004; 17:233-245.
- 220] Izak AM, Werner L, Apple DJ, et al. Loop memory of different haptic materials used in the manufacture of posterior chamber intraocular lenses. *J Cataract Refract Surg*. 2002; 28:1229–1235.