

**Visual performance post-refractive surgery**  
**By Catharine Chisholm**

**References**

28. Alanis L, Ramirez R, Suarez R, Climent A, Moreno L, Graue E et al. Spatial contrast sensitivity in pre and post-operative LASIK for high myopia patients. *Investigative Ophthalmology and Visual Science* 1996; 37:S570.

16. Alexander KR, Xie W, Derlacki DJ. Spatial frequency characteristics of letter identification. *Journal of the Optical Society of America [A] -Optics & Image Science* 1994; 11(9):2375-2382.

43. Alio, JL, Muftuoglu, O, Ortiz, D, Perez-Santonja, JJ, Artola, A, Ayala, MJ, Garcia, MJ and de Luna, GC. Ten-year follow-up of laser in situ keratomileusis for myopia of up to - 10 diopters. *Am J Ophthalmol* 145 (1) : 46-54 2008a Jan

44. Alio, JL, Muftuoglu, O, Ortiz, D, Perez-Santonja, JJ, Artola, A, Ayala, MJ, Garcia, MJ and de Luna, GC Ten-year follow-up of laser in situ keratomileusis for high myopia. *Am J Ophthalmol* 145 (1) : 55-64 2008b Jan (Epub 2007 Nov 08)

78. Awwad, ST, Bowman, RW, Cavanagh, HD and McCulley, JP. Wavefront-guided LASIK for myopia using the LADAR CustomCornea and the VISX CustomVue. *J Refract Surg* 23 (1) : 26-38 2007 Jan

41. Bababeygy, SR, Zoumalan, CI and Manche, EE. Visual outcomes of wavefront-guided laser in situ keratomileusis in eyes with moderate or high myopia and compound myopic astigmatism. *J Cataract Refract Surg* 34 (1) : 21-7 2008 Jan

26. Bahar, I, Lvinger, S and Kremer, I. Wavefront-guided LASIK for myopia with the Technolas 217z: results at 3 years. *J Refract Surg* 23 (6) : 586-90, discussion 591 2007 Jun

24. Bailey, MD and Zadnik, K. Outcomes of LASIK for myopia with FDA-approved lasers. *Cornea* 26 (3) : 246-54 2007 Apr Bailey, MD and Zadnik, K. Outcomes of LASIK for myopia with FDA-approved lasers. *Cornea* 26 (3) : 246-54 2007 Apr

58. Beerthuizen, JJG, Franssen, L, Landesz, M and van den Berg, TJTP. Straylight values 1 month after laser in situ keratomileusis and photorefractive keratectomy. *J Cataract Refract Surg* 33 (5) : 779-83 2007 May

23. Binder, PS and Rosenshein, J. Retrospective comparison of 3 laser platforms to correct myopic spheres and spherocylinders using conventional and wavefront-guided treatments. *J Cataract Refract Surg* 33 (7) : 1158-76 2007 Jul

13. Boxer-Wachler BS, Krueger RR. Normalised contrast sensitivity values. *Journal of Refractive Surgery* 1998; 14(4):463-466.

22. Boxer-Wachler B.S., Durrie DS, Assil KK, Krueger RR. Improvement of visual function with glare testing after photorefractive keratectomy and radial keratotomy. *American Journal Of Ophthalmology* 1999; 128(5):582-587.

1. Brunette I, Gresset J, Boivin JF, et al. Functional outcome and satisfaction after photorefractive keratectomy - Part 2: Survey of 690 patients. *Ophthalmology* 2000;107(9):1790-6;
73. Buzzonetti, L, Petrocelli, G, Valente, P, Tamburrelli, C, Mosca, L, Laborante, A and Balestrazzi, E. Comparison of corneal aberration changes after laser in situ keratomileusis performed with mechanical microkeratome and IntraLase femtosecond laser: 1-year follow-up. *Cornea* 27 (2) : 174-9 2008 Feb
50. Camellin, M and Wyler, D. Epi-LASIK versus epi-LASEK. *J Refract Surg* 24 (1) : S57-63 2008 Jan.
8. Campbell FW, Robson JG. Application of Fourier analysis to the visibility of gratings. *Journal of Physiology* 1968; 197:551-566.
40. Chisholm CM, Evans ADB, Harlow AJ, Barbur JL. New test to assess pilot's vision following refractive surgery. *Aviation, Space and Environmental Medicine* 2003; 74:551-559.
55. Claringbold II. Laser-assisted subepithelial keratectomy for the correction of myopia. *Journal of Cataract & Refractive Surgery* 2002; 28(1):18-22.
47. Desai, RU, Jain, A and Manche, EE. Long-term follow-up of hyperopic laser in situ keratomileusis correction using the Star S2 excimer laser. *J Cataract Refract Surg* 34 (2) : 232-7 2008 Feb
71. Edgar DF, Barbur JL, Woodward EG. Pupil size measurements in relation to light scatter in the eye. *Invest Ophthalmol Vis Sci* 36[4], S938. 1995.
18. Elliott DB, Bullimore MA, Bailey IL. Improving the reliability of the Pelli-Robson contrast sensitivity test. *Clinical Visual Science* 1991; 6(6):471-475.
27. El-Maghraby A, Salah T, Waring GO, et al. Randomized bilateral comparison of excimer laser in situ keratomileusis and photorefractive keratectomy for 2.50 to 8.00 diopters of myopia. *Ophthalmology* 1999;106(3):447-57.
31. Ghosh, S, Couper, TA, Lamoureux, E, Jhanji, V, Taylor, HR and Vajpayee, RB. Evaluation of iris recognition system for wavefront-guided laser in situ keratomileusis for myopic astigmatism. *J Cataract Refract Surg* 34 (2) : 215-21 2008 Feb
49. Gil-Cazorla, R, Teus, MA, Arranz-Marquez, E and Marina-Verde, C. Phakic refractive lens (Medennium) for correction of +4.00 to +6.00 diopters: 1-year follow-up. *J Refract Surg* 24 (4) : 350-4 2008 Apr
7. Ginsburg AP, Evans DW, Sekule R, Harp SA. Contrast sensitivity predicts pilots' performance in aircraft simulators. *American Journal of Optometric and Physiological Optics* 1982; 59:105-109.
10. Ginsburg AP, Cannon MW. Comparison of three methods for rapid determination of threshold contrast sensitivity. *Investigative Ophthalmology and visual science* 1983; 24(4):798-801.

9. Ginsburg AP, Evans DW, Cannon MW, Owsley C, Mulvanny P. Large sample norms for contrast sensitivity. *American Journal of Optometry and Physiological Optics* 1984; 61:80-84.
46. Kato, N, Toda, I, Hori-Komai, Y, Sakai, C and Tsubota, K. Five-year outcome of LASIK for myopia. *Ophthalmology* 115 (5) : 839-844.e2 2008 May
52. Katsanevaki, VJ, Kalyvianaki, MI, Kavroulaki, DS and Pallikaris, IG. One-year clinical results after epi-LASIK for myopia. *Ophthalmology* 114 (6) : 1111-7 2007 Jun
33. Kim, TW, Wee, WR, Lee, JH, Kim, MK. Contrast sensitivity after LASIK, LASEK, and wavefront-guided LASEK with the VISX S4 laser. *J Refract Surg* 23 (4) : 355-61 2007 Apr
42. Kohnen T, Meltendorf C, Cichocki M. LASIK using a scanning spot excimer laser for the treatment of myopia and myopic astigmatism. A 3-year follow-up. *Ophthalmologie* 2005; 102(4):363
25. Kojima, T, Hallak, J and Azar, DT. Control-matched analysis of laser in situ keratomileusis outcomes in high myopia. *J Cataract Refract Surg* 34 (4) : 544-50 2008 Apr
3. Levinson, BA, Rapuano, CJ, Cohen, EJ, Hammersmith, KM, Ayres, BD and Laibson, PR Referrals to the Wills Eye Institute Cornea Service after laser in situ keratomileusis: reasons for patient dissatisfaction. *J Cataract Refract Surg* 34 (1) : 32-9 2008 Jan
11. Long GM, Penn DL. Normative contrast sensitivity functions: the problem of comparison. *American Journal of Optometry and Physiological Optics* 1987; 64(2):131-135
20. Mantyjarvi M, Laitinen T. Normal values for the Pelli-Robson contrast sensitivity test. *Journal of Cataract and Refractive Surgery* 2001; 27(2):261-266.
65. Marcos S, Barbero S, Moreno-Barriuso E, et al. Total and corneal aberrations before and after standard LASIK refractive surgery. *Invest Ophthalmol Vis Sci* 42[4], S2843. 2001
62. Martinez CE, Applegate RA, Howland HC, et al. Changes in corneal aberration structure after photorefractive keratectomy. *Invest Ophthalmol Vis Sci* 37[4], S933. 1996
61. Martinez CE, Applegate RA, Klyce SD. Effect of pupillary dilation on corneal optical aberrations after photorefractive keratectomy. *Arch Ophthalmol* 1998; 116(8):1053-1062
74. Medeiros, FW, Stapleton, WM, Hammel, J, Krueger, RR, Netto, MV and Wilson, SE. Wavefront analysis comparison of LASIK outcomes with the femtosecond laser and mechanical microkeratomes. *J Refract Surg* 23 (9) : 880-7 2007 Nov
34. Montes M, Chayet A, Gomez L, Magallanes R, Robledo N. Laser in situ keratomileusis for myopia of -1.50 to -6.00 diopters. *Journal of Refractive Surgery* 1999; 15(2):106-110.
19. Montes-Mico R, Charman WN. Choice of spatial frequency for contrast sensitivity evaluation after corneal refractive surgery. *Journal of Refractive Surgery* 2001; 17(6):646-651

38. Montes-Mico R, Charman WN. Mesopic contrast sensitivity function after excimer laser photorefractive keratectomy. *Journal of Refractive Surgery* 2002; 18(1):9-13.
35. Montes-Mico, R, Rodriguez-Galietero, A and Alio, JL. Femtosecond laser versus mechanical keratome LASIK for myopia. *Ophthalmology* 114 (1) : 62-8 2007 Jan
79. Moshirfar, M, Espandar, L, Meyer, JJ, Tanner, JR and Holz, HA. Prospective randomized trial of wavefront-guided laser in situ keratomileusis with the CustomCornea and CustomVue laser systems. *J Cataract Refract Surg* 33 (10) : 1727-33 2007 Oct
14. Murray, IJ, Parry, NRA, Ritchie, SIM, Bremner, RE, Brahma, A, Ikram, K, Tahir, HJ Importance of grating orientation when monitoring contrast sensitivity before and after refractive surgery. *J Cataract Refract Surg* 34 (4) : 551-6 2008 Apr
30. Mutyala S, McDonald MB, Scheinblum KA, Ostrick MD, Brint SF, Thompson H. Contrast sensitivity evaluation alter laser in situ keratomileusis. *Ophthalmology* 2000; 107(10):1864-1867.
56. O'Brart DPS, Patsoura E, Jaycock P, Rajan M, Marshall J. Excimer laser photorefractive keratectomy for hyperopia: 7.5-year follow-up. *Journal of Cataract and Refractive Surgery* 2005; 31(6):1104-1113.
53. O'Brart, DPS, Mellington, F, Jones, S and Marshall, J. Laser epithelial keratomileusis for the correction of hyperopia using a 7.0-mm optical zone with the Schwind ESIRIS laser. *J Refract Surg* 23 (4) : 343-54 2007 Apr
63. Oliver KM, O'Brart DPS, Stevenson CS, Hemenger RP, Applegate RA, Tomlinson A et al. Corneal aberrations and visual performance following photorefractive keratectomy (PRK) for hyperopia. *Investigative Ophthalmology and Visual Science* 1997; 38:S531.
60. Oshika T, Klyce SD, Applegate RA, Howland HC. Changes in corneal wavefront aberrations with aging. *Investigative Ophthalmology and Visual Science* 1999a; 40(7):1351-1355.
66. Oshika T, Klyce SD, Applegate RA, Howland HC, el Danasoury MA. Comparison of corneal wavefront aberrations after photorefractive keratectomy and laser in situ keratomileusis. *American Journal Of Ophthalmology* 1999b; 127(1):1-7.
70. Oshika T, Miyata K, Tokunaga T, et al. Higher order wavefront aberrations of the cornea and magnitude of refractive correction in laser in situ keratomileusis. *Ophthalmology* 2002; 109(6):1154-1158.
6. Owsley C, Sloane ME. Contrast sensitivity, acuity, and the perception of "real-world" targets. *British Journal of Ophthalmology* 1987; 71:791-796.
15. Parish DH, Sperling G. Object spatial frequencies, retinal spatial frequencies, noise and the efficiency of letter discrimination. *Vision Research* 1991; 31(7):1399-1415.
17. Pelli DG, Robson JG, Wilkins AJ. The design of a new letter chart for measuring contrast sensitivity. *Clinical Visual Science* 1988; 2:187-199.
29. Perez-Santonja JJ, Sakla HF, Alio JL. Contrast sensitivity after laser in situ keratomileusis. *Journal of Cataract and Refractive Surgery* 1998; 24(2):183-189.

36. Pop M, Payette Y. Photorefractive keratectomy versus laser in situ keratomileusis: a control-matched study. *Ophthalmology* 2000; 107(2):251-257.
12. Rabin J. Luminance effects on visual acuity and small letter contrast sensitivity. *Optometry And Vision Science* 1994; 71(11):685-688.
57. Rajan M, Jaycock P, O'Brart DPS, Hamberg Nystrom H, Marshall J. A long-term study of photorefractive keratectomy: 12-year follow-up. *Ophthalmology* 2004; 111(10):1813-1824.
80. Schallhorn, SC, Farjo, AA, Huang, D, Boxer Wachler, BS, Trattler, WB, Tanzer, DJ, Majmudar, PA and Sugar, A. Wavefront-guided LASIK for the correction of primary myopia and astigmatism a report by the american academy of ophthalmology. *Ophthalmology* 115 (7) : 1249-61 2008 Jul
2. Schmidt, GW, Yoon, M, McGwin, G, Lee, P and McLeod, SD. Evaluation of the relationship between ablation diameter, pupil size, and visual function with vision-specific quality-of-life measures after laser in situ keratomileusis. *Arch Ophthalmol* 125 (8) : 1037-42 2007 Aug
64. Seiler T, Kaemmerer M, Mierdel P, Krinke HE. Ocular optical aberrations after photorefractive keratectomy for myopia and myopic astigmatism. *Archives Of Ophthalmology* 2000; 118(1):17-21.
45. Sekundo W, Bonicke K, Mattausch P, Wiegand W. Six-year follow-up of laser in situ keratomileusis for moderate and extreme myopia using a first-generation excimer laser and microkeratome. *Journal of Cataract and Refractive Surgery* 2003; 29:1152-1158.
68. Sharma, M, Wachler, BSB and Chan, CCK. Higher order aberrations and relative risk of symptoms after LASIK. *J Refract Surg* 23 (3) : 252-6 2007 Mar
5. Stanley, PF, Tanzer, DJ and Schallhorn, SC. Laser refractive surgery in the United States Navy. *Curr Opin Ophthalmol* 19 (4) : 321-4 2008 Jul
32. Stonecipher, KG and Kezirian, GM. Wavefront-optimized versus wavefront-guided LASIK for myopic astigmatism with the ALLEGRETTO WAVE: three-month results of a prospective FDA trial. *J Refract Surg* 24 (4) : S424-30 2008 Apr
54. Taneri S, Azar DT. LASEK: results after 1 year. Retrospective analysis based on the dioptric power matrix for moderate myopic and astigmatic correction. *Ophthalmologie* 2005; 102(3):235-240.
51. Teus, MA, de Benito-Llopis, L and Sanchez-Pina, JM. LASEK versus LASIK for the correction of moderate myopia. *Optom Vis Sci* 84 (7) : 605-10 2007 Jul
4. Van de Pol, C, Greig, JL, Estrada, A, Bissette, GM and Bower, KS Visual and flight performance recovery after PRK or LASIK in helicopter pilots. *Aviat Space Environ Med* 78 (6) : 547-53 2007 Jun
76. Venter, J. Wavefront-guided custom ablation for myopia using the NIDEK NAVEX laser system. *J Refract Surg* 24 (5) : 487-93 2008 May
59. Veraart HGN, van den Berg TJTP, IJspeert IK, Lopes Cardozo O. Straylight in radial keratotomy and the influence of pupil size and straylight angle. *American Journal Of Ophthalmology* 114, 424-428. 1992.

72. Villa, C., Gutierrez, R., Jimenez, JR and Gonzalez-Meijome, JM. Night vision disturbances after successful LASIK surgery. *Br J Ophthalmol* 91 (8) : 1031-7 2007 Aug
21. Vos JJ. Disability glare: theory and practice. *Proceedings CIE, Brussels 1959*;298-306.
67. Waheed S, Chalita MR, Xu M, Krueger RR. Flap-induced and laser-induced ocular aberrations in a two-step LASIK procedure. *Journal of Refractive Surgery* 2005; 21(4):346-352.
39. Waring, G, Dougherty, PJ, Chayet, A, Fischer, J, Fant, B, Stevens, G and Bains, HS. Topographically guided LASIK for myopia using the Nidek CXII customized aspheric treatment zone (CATz). *Trans Am Ophthalmol Soc* 105 : 240-6; discussion 247-8 2007
48. Williams, LB, Dave, SB and Moshirfar, M. Correlation of visual outcome and patient satisfaction with preoperative keratometry after hyperopic laser in situ keratomileusis. *J Cataract Refract Surg* 34 (7) : 1083-8 2008 Jul
37. Yang CN, Shen EP, Hu FR. Laser in situ keratomileusis for the correction of myopia and myopic astigmatism. *Journal of Cataract and Refractive Surgery* 2001; 27(12):1952-1960.
69. Yu, J, Chen, H and Wang, F. Patient satisfaction and visual symptoms after wavefront-guided and wavefront-optimized LASIK with the WaveLight platform. *J Refract Surg* 24 (5) : 477-86 2008 May
77. Zhang, J, Zhou, Y, Wang, N and Li, R. Comparison of visual performance between conventional LASIK and wavefront-guided LASIK with iris-registration. *Chin Med J (Engl)* 121 (2) : 137-42 2008 Jan 20
75. Zhou, C, Jin, M, Wang, X and Ren, Q. Corneal wavefront-guided ablation with the Schwind ESIRIS laser for myopia. *J Refract Surg* 23 (6) : 573-80 2007 Jun