

## Press Release

### **No learning phase for the brain necessary „aberration-free“ treatment by SCHWIND**

Kleinostheim, Germany, November 2006

The optical quality of an eye is significantly determined through lower and higher order aberrations. These always define an optical error, regardless of whether they are corneal or ocular aberrations. Studies<sup>1</sup> of untreated eyes show that patients with above-average visual acuity ( $> 1,0$ ) can have higher-order aberrations. Thereby, no relationship between these higher-order aberrations and visual acuity of untreated eyes could be determined. Because the brain adjusts to aberrations through the help of neural compensation, it is not always advantageous to remove all aberrations through laser correction.<sup>2</sup>

#### **Habitual sight impression remains with „aberration-free“ treatment**

SCHWIND eye-tech-solutions has developed the „aberration-free“ treatment for patients whose sight is not affected by existing higher-order aberrations and for those who – only corrected with glasses - possess a visual acuity of 1.0 or better. With this treatment, the (pre-operative) higher-order aberrations remain unchanged. Advantage: The patient retains the habitual sight impression and the brain requires no learning phase to deal with added bothersome changes. „Aberration-free“ means: During the laser treatment, only spherical and/or cylindrical refractive values are corrected. No optical higher-order aberrations are changed, nor additional aberrations induced, that could reduce vision sharpness

and contrast, as opposed to classical treatments and a number of aspheric methods used in the market that induce aberrations.

**„Customized“ treatment for significant higher order aberrations**

If the diagnostically assured higher-order aberrations impair the visual sense, they should be corrected. In this case, SCHWIND´s wavefront-guided, so-called „customized“ treatment is the right choice. Corneal and/or ocular wavefront data are included and allow individual, patient-oriented treatment.

With both treatment methods, the „aberration-free“ as well as the „customized“ treatment, aspherical ablation profiles are employed. The aspherical ablation profiles of the SCHWIND ORK-CAM software module ensure that induced aberrations through biomechanical influences are compensated. Such influences include the microkeratome cut, tissue removal and thinning of the cornea, as well as varying energy losses depending on the corneal curvature during laser correction.

<sup>1</sup> P. Artal et. al., What aberration pattern (if any) produces the best vision, 6th international Wavefront Congress, Athens, Greece, February 2005

X. Cheng, X., Bradley, A., & Thibos, L. N. (2004). Predicting subjective judgment of best focus with objective image quality metrics. *Journal of Vision*, 4(4), 310-321

R.A. Applegate et. al., Are all Aberrations equal?, *Journal of Refractive Surgery* 2002; **18:S556-S562**

<sup>2</sup> P. Artal, L. Chen, L., E-J. Fernández, E. J., Singer, B., Manzanera, S., & Williams, D. R. (2004). Neural compensation for the eye's optical aberrations. *Journal of Vision*, 4(4), 281-287

**SCHWIND treatment methods at a glance:**

Treatment method	Ablation Profile	SCHWIND Technology
„Classical“ treatment	Based on the Munnerlynn formula	ESIRIS
„Aberration-free“ treatment	Aspheric profiles	ESIRIS + ORK-CAM
„Customized“ treatment <ul style="list-style-type: none"> <li>• Corneal wavefront</li> <li>• Ocular wavefront</li> </ul>	Aspheric profiles	ESIRIS + ORK-CAM + Corneal Wavefront Analyzer  ESIRIS + ORK-CAM + Ocular Wavefront Analyzer

**Press Contact:**

SCHWIND eye-tech-solutions GmbH & Co. KG  
 Antje Splittdorf,  
 fon: +49 (0) 60 27 / 5 08-164 · fax: +49 (0) 60 27 / 5 08-246  
 email: antje.splittdorf@eye-tech.net