Comparison of Bilateral Reading Performance Among Two Presbyopia-Correcting Intraocular Lenses

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OBJECTIVES

The purpose of this study was to compare reading speed at high contrast and high luminance, monocular and binocular visual acuities, mean spherical equivalents, contrast sensitivity and visual symptoms (dysphotopsia) with either:

- FineVision HP trifocal IOL (PhysIOL)
- **TECNIS Synergy™** bifocal EDOF IOL (Johnson & Johnson Surgical Vision).

STUDY DESIGN

42 patients (84 eyes) received bilateral IOL implantation: Two groups of 21 patients each.
The following were evaluated at one month post operatively:

- Binocular reading speed
- Visual acuity
- Mean spherical equivalent
- Contrast Sensitivity
- Visual symptoms (dysphotopsia)

RESULTS

READING SPEED

- The average reading speeds were higher in the **TECNIS Synergy™** group compared to the FineVision HP group.
- The difference was significant at 100% luminance for 100% and 30% contrast (with $P = .01$ and $P < .01$ respectively) while reading distances were similar for both lenses.

VISUAL ACUITY, MEAN SPHERICAL EQUIVALENT AND REFRACTION

- There was no statistically significant difference in UDVA between the two groups for both monocular and binocular ($P = .81$ and .86, respectively).
- The defocus curve was more dome-shaped for the **TECNIS Synergy™** IOL.
- A lesser predictivity of the power calculation was found for the FineVision HP IOL group.

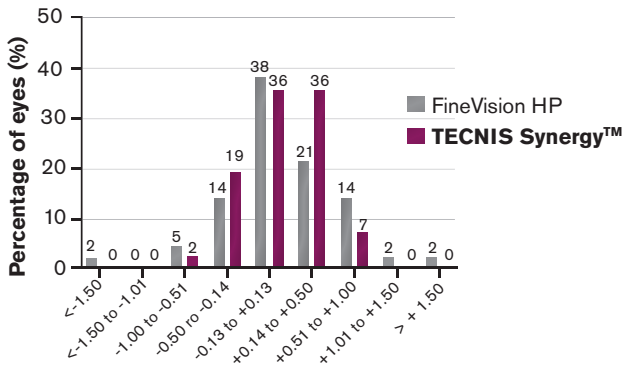

Figure 1. Postoperative distribution of spherical equivalents. The FineVision HP trifocal intraocular lens is manufactured by PhysIOL and the **TECNIS Synergy™** intraocular lens is manufactured by Johnson & Johnson Surgical Vision.

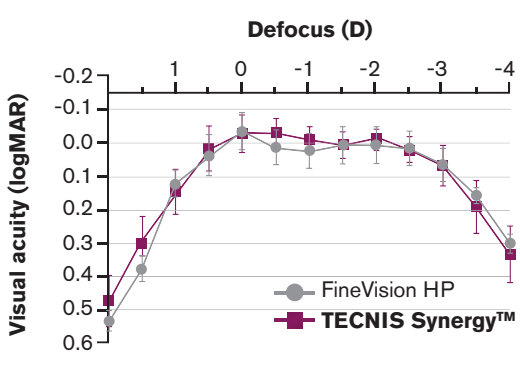

Figure 2. Defocus curves. Y-axis: visual acuity in logMAR and X-axis: defocus in diopters (blur test). The FineVision HP trifocal intraocular lens is manufactured by PhysIOL and the **TECNIS Synergy™** intraocular lens is manufactured by Johnson & Johnson Surgical Vision.

Johnson & Johnson VISION

CONTRAST SENSITIVITY

- The graphical analysis showed that results were globally comparable between the two IOLs.

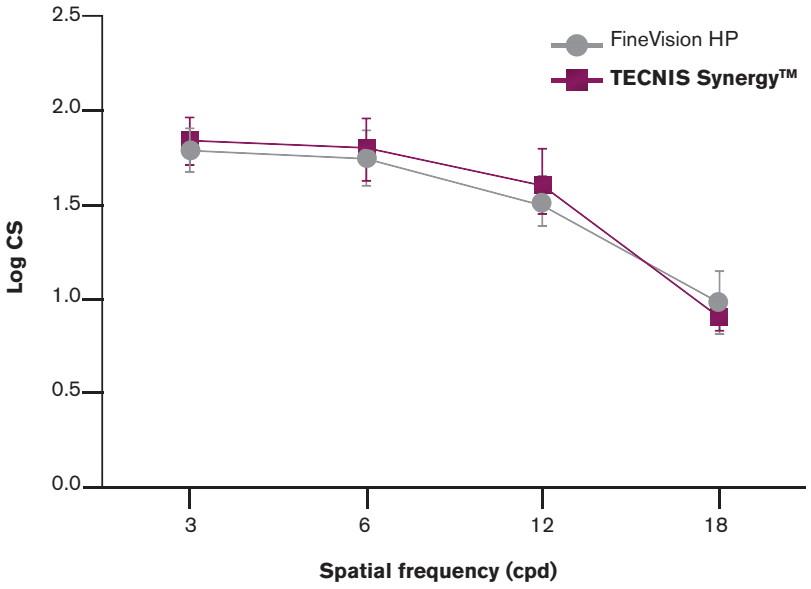

Figure 3. Contrast sensitivity (binocular) as a function of spatial frequency (VectorVision CSV-1000E). The FineVision HP trifocal intraocular lens is manufactured by PhysIOL and the **TECNIS Synergy™** intraocular lens is manufactured by Johnson & Johnson Surgical Vision. cpd = cyles per degree; Log CS = logarithm of contrast sensitivity.

VISUAL SYMPTOMS (DYSPHOTOPSIA)

- The glare angle was significantly greater in the **TECNIS Synergy™** group than in the FineVision HP group at -0.19 degrees (95% CI: -0.36 to 0.03) (*P* = .02).
- Discomfort during driving was absent in the **TECNIS Synergy™** group
- The satisfaction rate was 85.7% in the FineVision HP group versus 95.2% in the **TECNIS Synergy™** group, with no statistically significant difference (*P* = .61).

CONCLUSION

- **TECNIS Synergy™** IOL provided faster reading speeds, with a difference demonstrated at 100% and 30% contrast (+28.6% and +52.0%, respectively).
- These results are even more promising because they are close to the oral reading speed of 183 (95% CI: 177 to 189) words per minute, as found in healthy individuals aged 17 to 60 years.
- Unlike the trifocal lens that requires emmetropisation, the **TECNIS Synergy™** IOL seems to have good tolerance to spherical or cylindrical residual refractive error.
- While the glare test showed a greater scotoma for patients in the **TECNIS Synergy™** group, the absence of discomfort was more frequent in patients implanted with the **TECNIS Synergy™** IOL.

Reference: Benyoussef A, et al. Comparison of bilateral reading performance among two presbyopia-correcting intraocular lenses. *J Refract Surg 2022;* doi: 10.3928/1081597X-20220516-02. REF2022CT4284.

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