

Session 2-D: Refractive: Night Vision, Flap Complications

Title: Prospective Comparison of 4 Excimer Laser Systems Using a Night-Driving Simulator After LASIK

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PURPOSE: To prospectively compare four excimer laser systems using a night driving simulator after LASIK.

METHODS: Detection and identification distances of 2 different road signs and a pedestrian hazard during nighttime driving (rural road at 55 mph, Vision Research Sciences Corp.) with and without glare was measured in 75 subjects before and 6 months after conventional LASIK (4 different lasers; preop MSE $\leq 5.712D$). Each eye was tested independently. 21 subjects/42 eyes were treated with the Alcon Ladarvision 4000, 18/36 with a Bausch & Lomb Technolas 217, 18/36 with a Nidek EC-5000, and, 18/36 with a VISX laser system. Laser group treatments (sphere, cylinder, MSE) were similar (ANOVA, $p \geq 0.7$).

RESULTS: Significant differences between lasers in night driving performance was observed (MANOVA, $p < 0.001$); postop to preop performance was not changed for the VISX, slightly reduced for Alcon, reduced for B&L, and even more reduced in the Nidek group (ANOVA, $\pm = 0.05$). In the Nidek cohort, average reduction in performance ranged from -29.5ft (0.37sec; 95% CI = -19.3 to -39.7ft) to -40.7ft (0.50sec; 95% CI = -25.0 to -56.6ft) for detection without glare to identification with glare, respectively. Change in performance was not significantly determined by type of road hazard (traffic or business sign, or pedestrian) or which eye (right/left or dominant/non-dominant) was used (MANOVA, $p \geq 0.13$).

CONCLUSIONS: Night driving visual performance can be degraded after conventional myopic LASIK and more frequently with certain laser systems.