

# Satisfaction of 13,655 Patients With Laser Vision Correction at 1 Month After Surgery

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## ABSTRACT

**PURPOSE:** To assess the level of laser vision correction patient satisfaction achieved by a large corporate provider of refractive surgery.

**METHODS:** A computer-based, interactive survey was used to query patients regarding their satisfaction with the services, experience, and results of their laser vision correction procedure.

**RESULTS:** Responses from 13,655 consecutive patients who completed their 1-month postoperative examination were analyzed in this study. A very high level of satisfaction was observed both for the quality of postoperative care provided (98.6%) and for the visual results obtained (95.0%). Most patients (94.2%) indicated that the surgery improved their life, and most would recommend both laser vision correction (96.5%) and the corporate provider (97.5%) to friends and family.

**CONCLUSIONS:** Patients report a high level of satisfaction with laser vision correction performed by a large corporate provider. [*J Refract Surg.* 2009;25:S642-S646.] doi:10.3928/1081597X-20090611-03

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lthough excellent clinical outcomes are essential to the success of every refractive surgery practice, the best providers do more than simply improve unaided visual acuity—they also provide a positive patient experience. To achieve this goal, leading refractive surgery practices evaluate the care they provide from their patients' perspective and use this feedback to continuously improve care.

Influenced by more than just the visual results of surgery, patient satisfaction hinges on a number of factors, including the demeanor and attentiveness of staff, how well the practice manages patients' expectations, and whether the surgery team effectively addresses patient anxiety before and during the procedure. Patient satisfaction can also be influenced by factors such as the physical appearance of the laser center and whether patients must wait a significant length of time before being examined or treated.

Optical Express, the largest corporate provider of laser vision correction in Europe, aims to continually measure its success in a variety of ways. An electronic patient satisfaction questionnaire was instituted in 2008 to evaluate the quality of care provided, how well patient expectations were met, and the level of patient satisfaction.

## MATERIALS AND METHODS

The Optical Express questionnaire is an online, real-time, interactive survey that is accessible on computer stations located in isolated areas of every Optical Express clinic. All laser vision correction patients are asked to complete this questionnaire immediately after 1-day, 1-week, 1-month, and 3-month postoperative follow-up. A unique patient identification number created by the Optical Express central office

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TABLE

**One-month Questionnaire**

1. How satisfied are you with the post-operative care that we have provided for you since your treatment? (Very satisfied; Satisfied; Neither satisfied nor dissatisfied; Dissatisfied; Very dissatisfied)
2. Overall how would you rate your Optical Express experience so far? (Excellent; Good; Average; Poor; Very Poor)
3. How long did you wait in the clinic before your post-operative appointment commenced? (Less than 10 minutes; 10-20 minutes; More than 20 minutes)
4. How is your vision now compared with your expectations pre-treatment? (Better; Same; Worse)
5. How satisfied are you with your vision today? (Very satisfied; Satisfied; Neither satisfied nor dissatisfied; Dissatisfied; Very dissatisfied)
6. Is your vision better than it was with spectacles/contact lenses? (Yes; No)
7. Has Laser Vision Correction changed your life for the better? (Yes; No)
8. Would you recommend Laser Vision Correction to your friends and family? (Yes; No)
9. Would you recommend Optical Express to your friends and family? (Yes; No)

is used to identify patient responses, but individual survey responses are not available to clinicians or other clinic personnel. The Table shows the questions included in the 1-month postoperative survey. The responses have 2-, 3-, or 5-distractor scales, specific to each question.

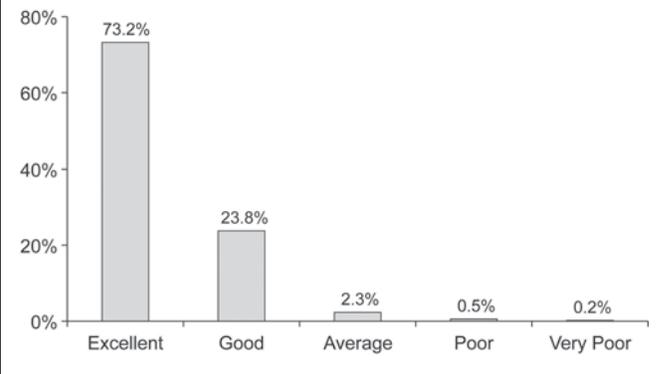
All refractive surgery patients were treated with either LASIK or laser epithelial keratomileusis (LASEK) depending on medical indications and patient preference. Ablations were performed using a STAR S4 IR excimer laser system (Abbott Medical Optics [AMO], Santa Ana, Calif). For LASIK patients, corneal flaps were created using either the IntraLase FS-60 (AMO) or the Moria Evo3 One Use-Plus microkeratome (Moria SA, Antony, France). For LASEK procedures, the epithelium was removed with an alcohol solution.

Questionnaire data were then extracted from the central clinical database for this analysis. Tabulations and statistics were performed using SAS 9.1 (SAS Institute Inc, Cary, NC) and Microsoft Office Excel 7.0 (Microsoft, Redmond, Wash).

**RESULTS**

A total of 34,760 consecutive patients underwent laser vision correction at Optical Express clinics after the questionnaire was implemented. The clinical model employed and details of clinical outcomes for these patients are described in another article

“Overall, how would you rate your Optical Express experience so far?”



**Figure 1.** Of 13,655 patients who completed the 1-month questionnaire, 73% rated their overall experience with Optical Express as “excellent” at 1-month follow-up.

in this supplement.<sup>1</sup> Ninety-two percent of patients (n=31,979) attended their 1-month postoperative examination. Of this subset, the 13,655 patients (43%) who completed the 1-month questionnaire were included in this analysis.

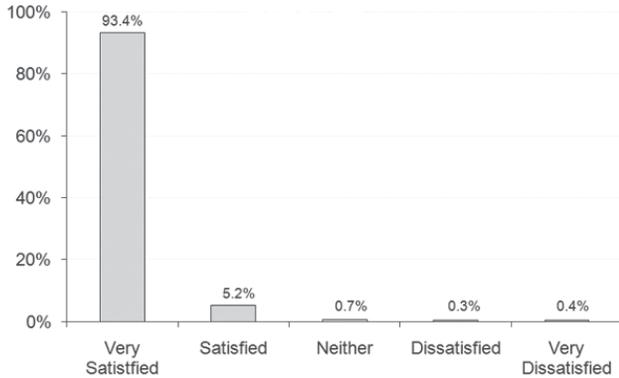
The 13,655 patients who completed the 1-month questionnaire were diverse in age (mean: 39.4 years; range: 18 to 71 years) and gender (45% male, 55% female). Treatments included both myopic and hyperopic corrections (mean manifest spherical equivalent:  $-2.27 \pm 2.66$  diopters [D]; range:  $-11.63$  to  $+6.00$  D) performed using both procedure types (91% LASIK, 9% LASEK).

Most demographic and preoperative factors were equivalent between patients who completed the 1-month questionnaire and those who did not. No significant differences were observed for pre- and postoperative sphere, cylinder, best spectacle-corrected visual acuity (BSCVA), and uncorrected visual acuity (UCVA). However, statistically significant differences were observed for age (difference 0.3 years; *t* test,  $P=.0159$ ), gender (male/female difference 3%; chi-square,  $P=.0076$ ), and type of procedure (LASIK/LASEK difference 2%; chi-square,  $P \leq .0001$ ).

Overall, survey results indicated a high level of patient satisfaction, with the majority of patients (97.0%) rating their overall experience with Optical Express as “good” or “excellent” (Fig 1). Most patients also gave positive feedback when asked about specific aspects of their care. For example, 98.6% of patients reported being satisfied with their postoperative care, and most patients said they did not have to wait long before the start of their postoperative appointment (Figs 2 and 3).

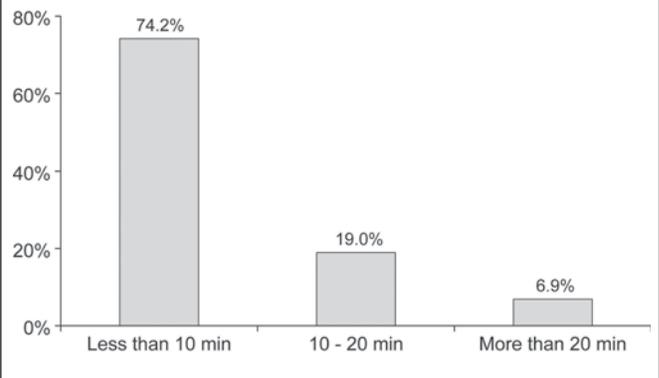
The majority of patients (95.0%) also reported being satisfied with their visual results after surgery (Fig 4).

**“How satisfied are you with the postoperative care that we have provided for you since your treatment?”**



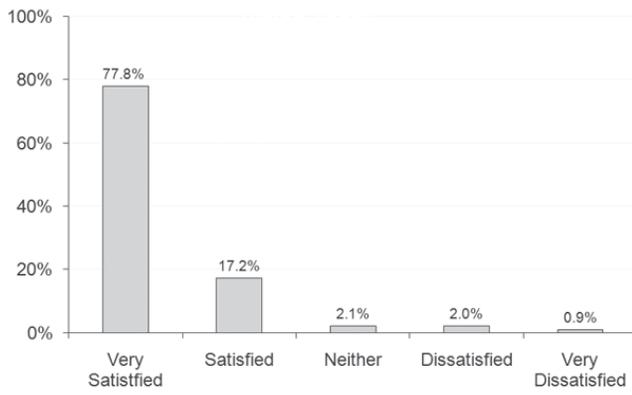
**Figure 2.** Of 13,655 patients who completed the 1-month questionnaire, 93.4% of patients reported being “very satisfied” with their postoperative care.

**“How long did you wait in the clinic before your postoperative appointment commenced?”**



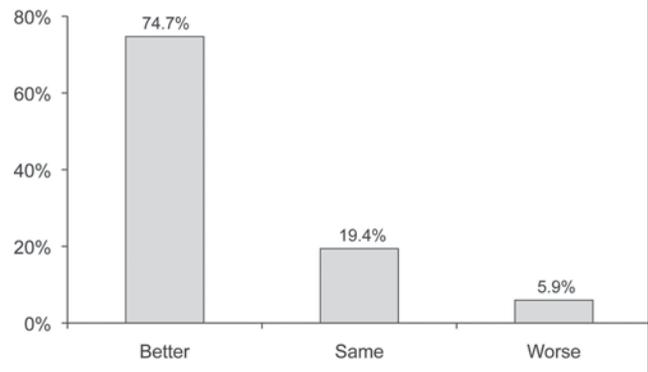
**Figure 3.** Of 13,655 patients who completed the 1-month questionnaire, the majority (74.2%) reported that they had to wait less than 10 minutes prior to their appointment.

**“How satisfied are you with your vision today?”**



**Figure 4.** Of 13,655 patients who completed the 1-month questionnaire, when asked “How satisfied are you with your vision today?” 77.8% of patients reported being very satisfied.

**“How is your vision now compared with your expectations pre-treatment?”**



**Figure 5.** Of 13,655 patients who completed the 1-month questionnaire, 75% reported that their vision after surgery was better than expected.

When asked to compare these results to their preoperative expectations, 94.1% of patients indicated that their visual results met or exceeded their expectations (Fig 5).

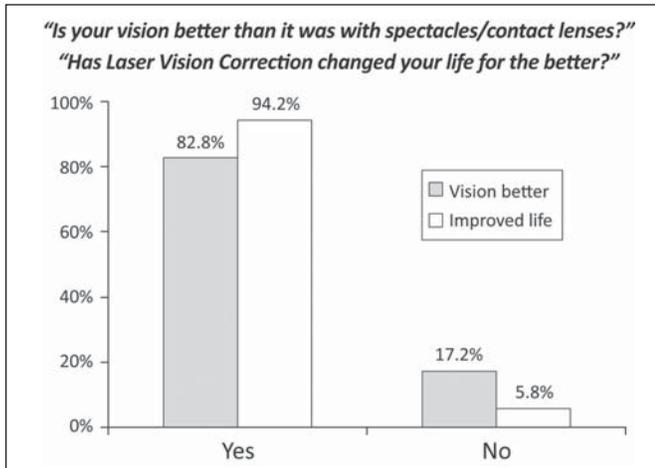
Finally, a high level of satisfaction was reported on a series of “yes/no” questions. A majority of patients (94.2%) stated that laser vision correction had changed their life for the better, and most patients (82.8%) indicated that their vision was better after surgery than it had been with spectacles or contact lenses (Fig 6). Almost all patients also indicated that they would recommend both laser vision correction (96.5%) and Optical Express (97.5%) to friends and family (Fig 7).

### DISCUSSION

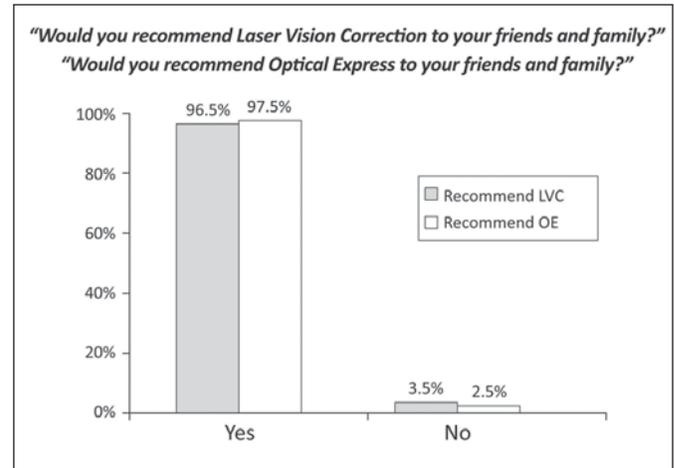
This study represents a real-world, large-scale evaluation of patient satisfaction with laser vision correction

delivered by a corporate provider. Including patients with a broad range of preoperative ametropia who received treatment using current technology, this study found a high level of satisfaction in terms of both the quality of care provided and patients’ visual results. Most patients also indicated that the surgery improved their life and that they would recommend both the procedure and the corporate provider to friends and family. These findings validate the perceived value of this elective procedure, and they confirm that a corporate provider can deliver laser vision correction in such a way that patients develop a high opinion of both the quality of care and their visual outcomes.

Because patient satisfaction is a valuable indicator of a practice’s performance, other studies have analyzed satisfaction with laser vision correction.<sup>2-7</sup> In fact, a re-



**Figure 6.** Of 13,655 patients who completed the 1-month questionnaire, 83% reported that their vision was better than it was with spectacles or contact lenses, and 94.2% said that laser vision correction had changed their life for the better.



**Figure 7.** Of 13,655 patients who completed the 1-month questionnaire, the majority (96.5%) would recommend laser vision correction (LVC) to friends and family, and a similarly high percentage (97.5%) would recommend Optical Express (OE).

cent meta-analysis of the laser vision correction literature was conducted in response to concerns about patient dissatisfaction after LASIK.<sup>8</sup> This meta-analysis included 309 pertinent articles with a combined total of 2199 patients, and overall satisfaction with LASIK was found to be 95.4%. Although this meta-analysis only evaluated LASIK patients and included assessments over a wide postoperative time period (range: 1 month to 10 years), the overall result was similar to the result of the current study.

One possible limitation of the current study is that it included LASEK patients who may not have achieved their final visual outcome by the time the 1-month questionnaire was administered. It is well known that visual recovery after a surface procedure, such as LASEK, can take longer than after LASIK.<sup>9-11</sup> If patients had not yet achieved their optimal visual outcome when the 1-month survey was taken, this could negatively impact the results obtained by the questionnaire. In addition, satisfaction after surgery can continue to improve beyond the 1-month postoperative follow-up regardless of the procedure. Together, these factors suggest that patient satisfaction could be higher if assessed at later time periods.

Another possible limitation of the current study is that only 43% of patients who attended the 1-month postoperative examination completed the patient satisfaction questionnaire. To evaluate a possible selection bias, patients who completed the questionnaire were compared to those who did not. Although this comparison found no differences in most preoperative parameters, small differences in age, gender, and type of procedure were statistically significant due to the large sample size. Although these differences are un-

likely to have true clinical relevance and the groups were well-matched for all other parameters, it is still possible that the patients who chose to fill out the survey were selectively satisfied or dissatisfied.

Finally, this study did not analyze all of the factors that may have contributed to patient satisfaction. Patients can be dissatisfied even when a procedure achieves a normal clinical outcome, so further work is ongoing to elucidate clinical factors that can influence patient satisfaction after surgery.

Clinical outcomes can determine the safety and efficacy of a procedure, however, these metrics cannot fully assess how patients value a procedure. By providing an essential complement to clinical outcome analyses, a computerized questionnaire such as that developed by Optical Express represents a valuable tool for assessing how patients perceive the quality of care they receive.

The most obvious use of such data is to direct changes that will enhance future patients' satisfaction. For instance, data from different clinical centers can be compared and analyzed, and centers that produce consistently high marks can be identified and studied. By applying the lessons learned from these centers to other centers, a large corporate provider can duplicate its successes over many locations.

#### AUTHOR CONTRIBUTIONS

*Study concept and design (M.C.B., S.C.S.); data collection (M.C.B., S.C.S., K.A.H., S.E.M.); interpretation and analysis of data (M.C.B., S.C.S., K.A.H., S.E.M.); drafting of the manuscript (M.C.B., S.C.S.); critical revision of the manuscript (M.C.B., S.C.S., K.A.H., S.E.M.); statistical expertise (S.C.S., K.A.H.); administrative, technical, or material support (S.C.S., S.E.M.); supervision (M.C.B., S.C.S.)*

### REFERENCES

1. Schallhorn SC, Venter JA. One-month outcomes of wavefront-guided LASIK for low to moderate myopia with the VISX STAR S4 laser in 32,569 eyes. *J Refract Surg.* 2009;25:S634-S641.
2. Morse JS, Schallhorn SC, Hettinger K, Tanzer D. Role of depressive symptoms in patient satisfaction with visual quality after laser in situ keratomileusis. *J Cataract Refract Surg.* 2009;35:341-346.
3. Schallhorn SC, Farjo AA, Huang D, Boxer Wachler BS, Trattler WB, Tanzer DJ, Majmudar PA, Sugar A; American Academy of Ophthalmology. Wavefront-guided LASIK for the correction of primary myopia and astigmatism a report by the American Academy of Ophthalmology. *Ophthalmology.* 2008;115:1249-1261.
4. Tuan KM. Visual experience and patient satisfaction with wavefront-guided laser in situ keratomileusis. *J Cataract Refract Surg.* 2006;32:577-583.
5. Tahzib NG, Bootsma SJ, Eggink FA, Nabar VA, Nuijts RM. Functional outcomes and patient satisfaction after laser in situ keratomileusis for correction of myopia. *J Cataract Refract Surg.* 2005;31:1943-1951.
6. Lee J, Lee J, Park K, Cho W, Kim JY, Kang HY. Assessing the value of laser in situ keratomileusis by patient-reported outcomes using quality of life assessment. *J Refract Surg.* 2005;21:59-71.
7. Bailey MD, Mitchell GL, Dhaliwal DK, Boxer Wachler BS, Zadnik K. Patient satisfaction and visual symptoms after laser in situ keratomileusis. *Ophthalmology.* 2003;110:1371-1378.
8. Solomon KD, Fernández de Castro LE, Sandoval HP, Biber JM, Groat B, Neff KD, Ying MS, French JW, Donnenfeld ED, Lindstrom RL; Joint LASIK Study Task Force. LASIK world literature review: quality of life and patient satisfaction. *Ophthalmology.* 2009;116:691-701.
9. Durrie DS, Slade SG, Marshall J. Wavefront-guided excimer laser ablation using photorefractive keratectomy and sub-Bowman's keratomileusis: a contralateral eye study. *J Refract Surg.* 2008;24:S77-S84.
10. Walker MB, Wilson SE. Recovery of uncorrected visual acuity after laser in situ keratomileusis or photorefractive keratectomy for low myopia. *Cornea.* 2001;20:153-155.
11. El-Maghraby A, Salah T, Waring GO III, Klyce S, Ibrahim O. Randomized bilateral comparison of excimer laser in situ keratomileusis and photorefractive keratectomy for 2.50 to 8.00 diopters of myopia. *Ophthalmology.* 1999;106:447-457.