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# Measuring the Impact of Femtosecond Laser Technology on Procedure Volume and Pricing

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## Abstract:

**Objective:** *To understand the impact of the use of Femtosecond laser technology on the procedure volume and pricing within refractive practices across the United States.*

**Methods:** *Formal interviews were conducted with the key surgeon and/or business manager of 32 practices nationwide using the INTRALASE® FS Laser to create lamellar flaps as part of the LASIK procedure. Interviews covered both qualitative impressions as well as historical financial data. Data were analyzed to compare procedure volumes and pricing with IntraLase against earlier time periods as well as against current industry averages.*

**Results:** *Mean use of the IntraLase device among the practices has been 8 months (range 1 to 15 months). Practices have performed an average of 1,422 procedures each, with over 41,000 collectively performed by the interviewed group to date. Comparing the IntraLase period (beginning Q1 2002 through Q1 2003) to the most recent time period prior to commercialization (Q1 2001 through Q4 2001), average quarterly procedures have declined 6%. Average selling prices during this same comparison period have increased 17%, and resulting quarterly revenue has increased 11%. For the comparable time period, industry averages have declined 13%, selling prices down 1% and quarterly revenue down 13%. On average, these practices are performing 85% of their LASIK procedures (current Q1 2003 data) using the IntraLase device. Approximately half of the practices (48%) use the technology on an exclusive basis.*

**Conclusion:** *IntraLase users as a group are significantly outperforming the average practice on key metrics of procedure growth, change in average selling price, and resultant quarterly revenue from LASIK procedures. Additionally, the rapid growth in adoption within these practices provides proof of surgeon and patient satisfaction with the IntraLase procedure.*

## Introduction

IntraLase™ Corp. (Irvine, CA) is an ophthalmic device manufacturer that is commercializing a femtosecond laser (INTRALASE® FS) for use in refractive surgery. The main application is for the purpose of creating a lamellar flap as part of the LASIK procedure.

IntraLase engaged SM<sup>2</sup> Consulting to conduct an independent formal survey of current U.S.-based customers to assess the financial impact of this technology and its level of integration at the practice level.

## Methods

A survey questionnaire and financial data form were developed and telephone interviews were conducted with the key refractive surgeon and/or business manager at each of the practices. Questions asked by the interviewers covered both qualitative issues (e.g., physician customer satisfaction, impact on patient interest in LASIK), as well as historical quantitative data (procedural volumes, average fees collected per eye treated, and the percent of overall cases performed via IntraLase vs. other microkeratomes). All data were analyzed using basic statistics to determine means and ranges for the variables of interest. Of 32 practices interviewed, data from 30 were sufficiently complete to be included in the survey. For some of the analyses, inclusion was limited to those practices that provided complete historical data (23 to 25, depending on the analysis).

Quarterly procedure volumes, average selling prices (defined as actual collected revenue per eye, not the price on the fee schedule), and percentage of LASIK cases performed via IntraLase (vs. mechanical microkeratome) were analyzed from Q1 2001 through the most recent completed quarter (Q1 2003). The fact that commercial use of the IntraLase device began in Q1 2002 facilitated comparison of data within each practice (IntraLase time period vs. pre-IntraLase time period), among customers, and against industry averages.

Due to the exhaustive nature of the survey, presentation in this paper will be limited to key findings of interest.

## Results

### Impact on Patient Interest in LASIK

The value proposition to consumers considering LASIK vs. IntraLase (the company has branded the name *IntraLASIK*<sup>®</sup>) is the ability to avoid the mechanical blade as part of the procedure. Practices reported overwhelmingly that it is easier to convert patient interest (25 of 30), while 1 reported that it is more difficult due to the increased cost of the procedure, and the other 4 said that it was the same (see Figure 1). A query into the top reasons among providers (multiple reasons allowed) reveals that their patients like the concept of “no blade” (40% mentioned this), understand the improved safety offered (52%), and that the IntraLase device provided sufficient perceived benefit for the patient to go forward with LASIK (44%).

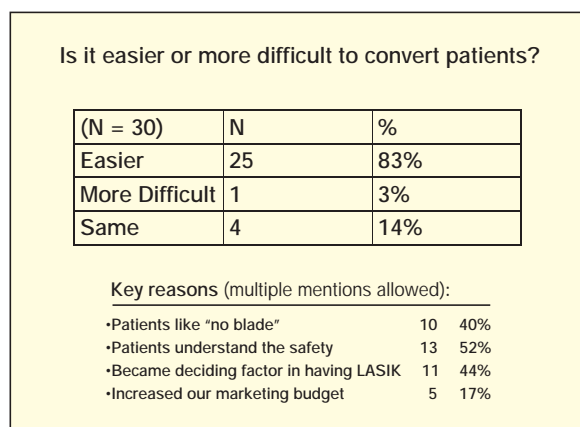


Figure 1

Nearly all (97%) practices use IntraLase in their external marketing and then continue through the marketing process (web sites, seminars, consultations). And while the majority of practices (67%) reported no difference in their overall closure rates (the % of those patients who have an evaluation and then move on to schedule surgery), 7 practices reported that their closure rates have improved on average from 64% (pre-IntraLase) to 75% currently. For these practices, the higher conversion rate has a significant impact on procedure volume and revenue.

### Impact on Average Selling Prices

For this study, average selling prices were defined as the amount of total revenue collected divided by the number of new eyes treated in the quarter. This definition factors out promotional discounts and blends together the impact from those customers who use a tiered-pricing model. Data was collected quarterly going back to Q1 2001. As shown in figure 2, the

average selling price across all IntraLase customers has increased steadily from \$1,555 per eye (Q4 2001) to \$1,842 per eye (Q1 2003). Q4 2001 was selected as the starting point because it is the most recent quarter prior to the commercial use of IntraLase. This represents an 18% increase or \$287 per eye. Over a comparable time period, industry averages (as reported by Market Scope) show a 1% change (\$15) from \$1,616 per eye (Q4 2001) to \$1,631 per eye (Q4 2002 used, as Q1 2003 data have not been published as of yet). This underestimates the actual increase in fee collected for IntraLase procedures, as the average is based on a blend of all fees collected, and IntraLase did not account for 100% of each customer's procedures (see section below on integration).

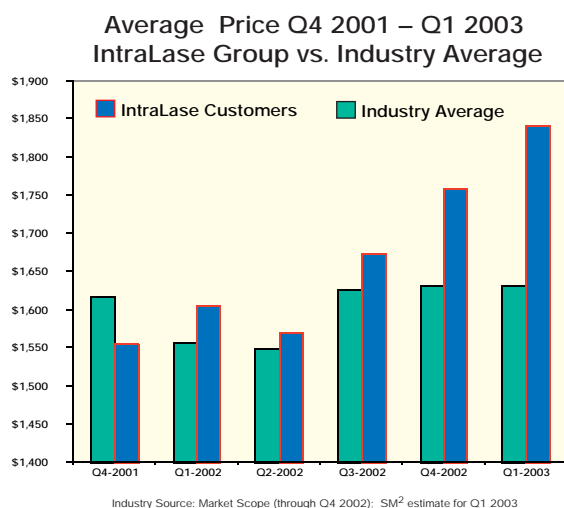


Figure 2

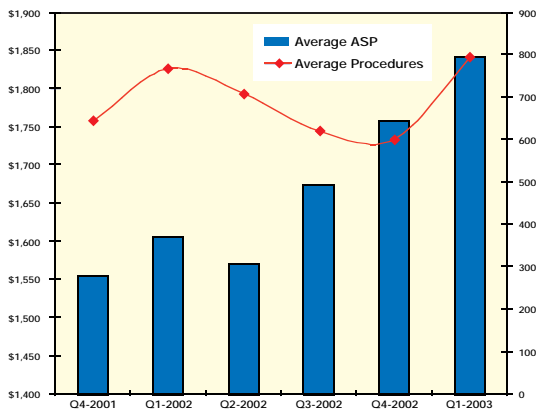
### Impact on Procedure Volumes

IntraLase practices experience seasonality in line with industry averages, which resembles a flattened sine wave or “roller coaster” appearance (see Figure 3). Procedure volumes are generally flat, being either slightly up or down depending on the comparison period (e.g., Q1 2003 is 3% higher than Q1 2002). However, this effect is relatively benign when compared with industry data. As shown in figure 5, IntraLase procedures are down less than half the amount (6% vs. 13%) of the comparable period for the industry.

### Impact on Retreatment Rates

Another important way of dimensionalizing financial impact is the change in retreatment rates for LASIK procedures. Reviews of available literature suggest overall retreatment rates for LASIK averaging from 9-11%, with ranges among surgeons as low as 1% and as high as 35%. For 13 of 30 surveyed IntraLase cus-

**IntraLase Procedures, Price and Integration:  
6 Consecutive Quarters**



# of customers	4	8	19	24	27
% IntraLase	68%	67%	55%	73%	85%

Figure 3

tomers, it has simply been too early to determine the impact on their retreatment rates (i.e., they wait at least 6 months before retreatment). Figure 4 is included, however, because 17/30 reported that they believe that the retreatment rate is indeed lower with IntraLase procedures. 7 of this subgroup of 17 practices have tracked their retreatment rates both historically and currently and report a change from an average of a 10% retreatment rate (reflecting national averages) to a current rate of 4%. The other 10/17 are awaiting hard data to be able to report.

And while these data points were not collected with the same level of scrutiny as the top-level financial data, they suggest that the femtosecond-created flap is positively impacting surgical retreatment rates. The financial implications are significant: Reduced post-operative examination time, less surgical time devoted to retreatment and, most importantly, higher overall patient satisfaction from getting it right the first time. Each of these can be quantified as less cost, more profitability, and higher referral rates.

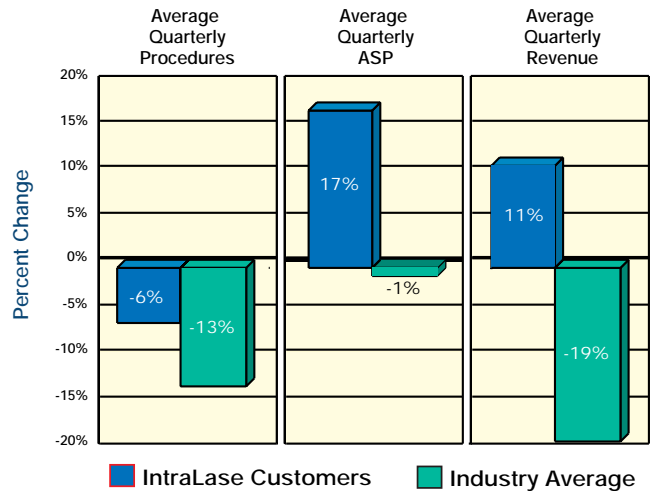
Figure 4

Any Difference in Retreatment Rate?	
• Too soon to tell:	13
• Yes, it's less:	17
– Of these 17, 7 had tracked data: <ul style="list-style-type: none"> <li>• Pre IL: 10% Re-Tx rate</li> <li>• Post IL: 4%</li> </ul> – The other 10/17 believe it is lower but don't yet have hard data	

**Integration into Practice**

Measurement of the percentage of total LASIK cases performed with IntraLase has shown a mean use in 85% (range of 50% to 100%) of all cases performed in Q1 2003. A median value of 96% is indicative of many practices that are currently using the IntraLase device exclusively on 100% of cases (13 of 27 that provided data), while another 9 practices use it from 90-99% of their total LASIK cases. A weighted average of cases performed (bottom of Figure 3) shows a trend towards high utilization of IntraLase across all customers. This started as 68% of cases averaged over 4 customers in the first full quarter of commercialization (Q1 2002) and has grown to 85% of cases across 27 customers in the most recent quarter (Q1 2003). The dip in the middle of 2002 is reflective of a large influx of new customers, many of whom reported that they "eased in" to the procedure gradually over several months. This allowed them to get comfortable with the procedure both intra-operatively and post-operatively and adjust surgical technique.

**Change in Procedures, Price, and Revenue  
IntraLase Group vs. Industry Averages  
(FY2001 as a baseline)**



Industry Data: MarketScope

Figure 5

Several doctors reported that, as with other new technologies, they experienced a learning curve that mainly affected Post-op Day 1 (POD1) visual acuity and patient satisfaction. They reported that their early cases were not as good visually on POD1 as they had become accustomed to with LASIK. However, all except one reported that adjustments in technique and laser parameters have allowed them to achieve POD1 acuity results similar to those obtained prior to IntraLase.

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## Financial Feasibility

Analysis of change in quarterly revenue (procedures times average price) for customers since acquiring IntraLase resolved an increase of 11% (vs. Pre-IntraLase), 15% (Q1 2003 vs. same quarter one year earlier) and 20% (Q1 2003 vs. same quarter two years earlier). This compares to a 17% decrease for the industry comparing quarterly averages for 2002 vs. 2001. Data for the industry for Q1 2003 are not yet available; however, it is apparent that the IntraLase customer group is outperforming the market on comparable financial metrics and even a very strong first quarter of 2003 is unlikely to change the percentages due to weakness in refractive demand experienced through most of 2002.

Regardless of the specific time period used for comparison, IntraLase users are commanding an average premium of \$264-\$287 per procedure for all eyes treated. For those practices that use IntraLase less than 100% of the time, the actual premium collected for IntraLase procedures will be higher.

Given the increased costs of doing the procedure of \$120 per eye (\$150 cost for each patient interface less \$30 cost per eye for a typical blade) and amortization of the capital expenditure for the laser, it appears that the typical IntraLase customer is at least "break even" or better financially.

## Conclusions

IntraLase users as a group are significantly outperforming the average practice on key metrics of procedure growth, change in average selling price, and resultant quarterly revenue from LASIK procedures. Even given the significant investment required (time, money, commitment), the technology appears to be "carrying its weight" as it becomes integrated into the practice. Secondary measurements that impact financial performance are evident and cannot be ignored: easier conversion of interest (i.e., more procedures sooner in time), lower retreatment rates, and equal to higher closure rates among interested patients. These will positively impact current business profitability and future prospects through higher patient satisfaction.

Qualitative findings confirm what the numbers show. Surgeons appreciate the technology and additional precision afforded by IntraLase. This, along with increased safety and reduced risk of complication, have served to lessen the stress on the surgeon and reduce fear in the patient considering refractive surgery.

## Discussion

The introduction of new technology into the refractive surgery arena is a tricky and difficult proposition for manufacturers as well as providers. While new technology is appealing to surgeons, it has shown to often backfire when promoted to refractive surgery candidates. Patients exposed to IntraLase appear to be gravitating to having the procedure. In those practices that offer IntraLase as an option or recommendation (vs. as the only way LASIK is performed), 2 of 3 patients are selecting IntraLase. It is not yet clear if IntraLase is growing overall demand and it is too early in the product's life cycle to predict if or when this will happen.

Surgeons overall are quite satisfied with their investment and integration of this new laser into their practice. While initially attracted because of the technology (18 of 30 mentioned), safety via less risk to the eye (17/30) and ability to differentiate (12/30), with experience they are reporting that this technology has made their professional life less stressful. "My surgical heart rate is more relaxed" is how one surgeon put it. Many indicate they like having more control over the LASIK procedure (10/30) and are seeing better outcomes (9/30). In spite of the high financial requirement, few surgeons reported being financially driven in their decision either initially (only 4 of 30 were seeking additional revenue) or currently (only 2 of 30 reported increased profitability as a new reason supporting purchase). Part of this is likely due to the "new"-ness of the offering in their local market.

The fact that it is being used on such a high percentage of cases is not surprising given the level of commitment required to invest and integrate the device. The adoption rate within the practice is reminiscent of LASIK's early days when it was still a small percentage of procedures relative to PRK. That quickly shifted as both patient and surgeon preference migrated over to LASIK's increased convenience and immediacy of effect post-operatively. Unlike several earlier technologies which failed to achieve any meaningful market penetration, IntraLase's femtosecond laser shows "signs of life" that may allow further adoption beyond a core group of innovative surgeons: the technology works and is demonstrating clinical benefit; patients and surgeons alike are adopting it; financial analysis is showing a per-eye premium that meets or exceeds per-eye costs (fully burdened). We look forward to being able to continue to assess adoption of this new technology and its impact on both the practice and the market.