

Femtosecond lasers in clinical practice: Ensuring your investment pays off

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Comprehensive ophthalmology practices are under increasing pressure to offer patients premium services at a low price. Patient expectation as well as practice differentiation is the driving force behind new technology integrations into clinical practice but few patients understand the economic balancing act that many clinicians must undergo in order to offer advanced medical technologies. Surgical femtosecond lasers currently represent one of the more costly but increasingly necessary devices in competitive practices and now deliver a versatile portfolio of surgical applications such as cataract, refractive, keratoplasty and other specialized corneal procedures. While access to a femtosecond laser for practice marketability and competitiveness is more important than ever, affordability remains a key concern.

Practices that do adopt femto laser technology have an edge on their local competitors. Unlike in previous times, the modern patient is sophisticated and not only understands but seeks out surgical solutions that tout bladeless, state-of-the-art and no-touch solutions. These concepts are easy for a practice to communicate and can be the deciding factor for the every-day patient that is looking for the best surgical experience. With the largest ever birth cohort now entering the age of retirement, the demand for femto cataract for instance should be a major focus of a competitive practice business model.

When contemplating the purchase of a femtosecond laser, a practice needs to consider several important questions: How will the device improve surgical workflow? How versatile is the device? Can the device be successfully communicated to patients as a part of a premium service? Will the device fit in the practice and is it easy to use? Can the device be easily moved or could it be shared with neighboring practices in a cost-sharing agreement? Depending on the clinic, most comprehensive ophthalmic practices do not necessarily need to purchase more than one femtosecond laser to fulfill the diverse needs of the practice. Understanding what the newest femtosecond lasers offer will help a practice invest in a device that will prove to be an economic asset rather than a cost burden.

Break-even point

Ensuring that the femtosecond laser can recoup its cost is a critical aspect in the decision making process. The cost/income break-even point has been conventionally determined by revenue generated from patient volume of a single application (e.g. cataract). However, with new femtosecond lasers offering more than one surgical application on a single device, when chosen smartly, a laser can reach the break-even point much quicker than in former years by securing patient volume over a number of diverse surgical procedures. In addition, using one laser for multiple procedures lowers training, service and maintenance costs. According to a 2013 survey, the break-even point for a clinic performing only cataract surgery was approximately 20 femto cataract cases each month for 5 years¹. If a practice performs 10 LASIK cases, 10 cataract cases and 2 inlay patients a month for instance; this break-even timeline can be comfortably maintained. Having the option to shift volume over a versatile procedure portfolio is an essential aspect of device affordability. For smaller practices, an all-in-one device such as the custom Swiss made FEMTO LDV Z8[®] offers a good option. Unlike the Catalys[®], LenSx[®] and LENSAR[®] devices, the Z8 performs all corneal and cataract functions including LASIK flaps and a number of advanced corneal applications (Table 1). The Visumax[®] and Intralase[®] femtosecond lasers are dedicated to refractive and corneal surgeries though not all applications are currently available in the USA. Regardless of what laser a practice purchases, maximizing the use of

the laser will allow a practice to reach the break-even point faster. The more versatility a laser can bring to a comprehensive ophthalmic practice, the better the investment.

	Z8	Catalys	LenSx	LENSAR	Victus	VisuMax	IntraLase
LASIK	✓	✗	✗*	✗	✓	✓	✓
Relex	✗	✗	✗	✗	✗	✓	✗
Rings	✓	✗	✗	✗	✓	✓	✓
Pockets	✓	✗	✗	✗	✗	✗	✓
LK	✓	✗	✗	✗	✓	✓	✓
PKP	✓	✗	✗	✗	✓	✓	✓
FLACS	✓	✓	✓	✓	✓	✗	✗
CCI	✓	✓	✓	✓	✓	✗	✗
AI	✓	✓	✓	✓	✓	✗	✗

Table 1. Comparison of features offered on different femtosecond laser platforms. LK – lamellar keratoplasty; PKP – penetrating keratoplasty; FLACS – femtosecond laser-assisted cataract surgery; CCI – clear corneal incisions; AI – Arcuate incisions. Z8 (Femto LDV)- Ziemer; Catalys - Abbot; LenSx - Alcon; LENSAR - Alphaeon; Victus - Bausch & Lomb. * LASIK flaps are not available in all devices in all global regions.

Cost sharing

Sharing a laser between one or more clinics can be another way to save money and reduce financial risk, particularly for small practices that specialize primarily in either cataract or refractive surgery. Although some additional costs regarding laser transport must be considered, the revenue made by increasing patient volume generally outweighs the costs. In the USA, so called “Ro-Ro” businesses (roll in, roll out) offer short-term rental of a device which is then delivered to the practice on a regular schedule (available for Catalys, Z8, LENSAR and other platforms depending on region). These services are good options for many practices that cannot capture enough patient volume to justify an own purchase. However, these services are more expensive on a per-use basis than sharing a device between several practices through a group purchase arrangement. Mobility of the laser in the inter-practice cost-sharing model is critical as many of the femtosecond lasers currently on the market are not manufactured to be mobile and require recalibration by a skilled technician after each move as a part of laser set-up. Both the LENSAR and Z8 lasers have built in wheels, but the Z8 is the only device manufactured for distance movement as it does not require manual recalibration after being moved. In addition, the LENSAR currently only performs cataract functions so is not suitable as a cost-sharing device among non-competitive practices that offer different services.

Time and Space

Cataract continues to be the most common surgery in the USA for patients of Medicare age with an estimated 3 million procedures per year². Femtosecond laser assisted cataract surgery (FLACS) is becoming a standard offering in ophthalmic practices as the baby boomers, reportedly the wealthiest generation in history³, demand premium treatment. In terms of medical outcomes, femto cataract significantly reduces phaco time^{4,5} and has been shown to be the best option for paring with premium IOLs due to superior centration and precise circularity of the capsulorhexis^{6,7}. Despite these advantages, questions have arisen regarding the efficiency of such platforms

particularly relating to surgical time. Two recent reports evaluating total surgical time of FLACS cataract versus conventional phacoemulsification found no notable difference in total surgical time (femto: 15.4±3.1 min vs. phaco 14.1±2.7; p=0.31), however, this effect was likely due to the mobile femto Z8 used in these studies. The FEMTO LDV Z8 can be used in a sterile environment and does not require the patient to be moved during the procedure thus acting as a time saving measure^{8,9}. Due to limitations in space, many surgeons report that two rooms are used for femto cataract whereby FLACS pre-treatment occurs in one room after which the patient is moved to another surgical room where the procedure is completed. Not only does this pose unnecessary risk to the patient but it may also raise costs due to the potential need for a more comprehensive practice insurance plan which covers liabilities relating to patient shuttling during surgery¹⁰. In addition, extra time arising from patient transfer during surgery translates into a decreased number of procedures per day, with some FLACS users reporting a 30–50% decrease in cases per day, a factor that significantly impacts revenue¹¹.

To avoid this loss, some surgeons have argued for the implementation of the so called ‘carousel’ or ‘assembly line’ approach whereby patients undergo FLACS pre-treatment and are then fed into multiple operating rooms where the procedure can be completed, thus eliminating lag time between cases¹². Needless to say, the functional practicality of such an approach for smaller clinics is out of the question, never mind the notion of trying to sell such an impersonal procedure to a patient seeking a premium service. When OR space is limited, the device with the smallest clinical footprint is needed to maximize efficiencies and ensure maintenance of patient volumes (Figure 1).

Spatial considerations, however, are not only relevant to the whole OR but also how much space a device takes up around the parameter of the patient bed. Most of the devices on the market have a static arm under which the patient must be positioned. The only exception to this is the Z8 laser which has an articulating arm, allowing the laser to be positioned on any side of the patient. On completion of the laser portion of a surgery, the arm can be moved and the laser quickly rolled away from the operating table. This feature is particularly beneficial in more complex surgeries such as keratoplasty where staff and trainees occupy much of the limited space around the patient. Technology that comes to the patient rather than the patient coming to the technology allows for the maximum flexibility in surgical work-flow.

Learning curve

Last, an important and often under considered aspect of choosing a femto laser is the efficiency of the learning curve. The patient interface of different femtosecond lasers differs significantly and surgeons are well advised to consider devices with an ergonomic design and fast learning curve in order to quickly capitalize on the new investment and ensure positive practice reputation within the local community. A wealth of reports in the literature discuss learning curve on different femto platforms and while a detailed overview of these manuscripts is outside the scope of this paper, it can be noted that the learning curve can and should be fast for an experienced cataract surgeon. LenSx users report a learning curve of around 20 cases¹³ while Z8 users have reported approximately 10 cases to reach proficiency¹⁴. Interestingly, the interfaces of these two systems are significantly different with the LenSx offering a motorized joy-stick approach which requires perfect positioning of the patient. The Z8 on the other hand has a docking system that is hand-held and utilizes the surgeon’s own combined years of experience to feel the correct docking position. As a practical consideration, patients are not a one-size-fits all group and the hand-held interface can be particularly useful when difficult patient positioning is encountered such as in cases with scoliosis or morbid obesity. If a patient is not sedated, patient compliance in remaining still can also prevent stable docking though with the Z8 the hand-held interface moves with the patient.

Make the laser work for you, not you for the laser

Practitioners strive to offer patients the most cutting-edge, innovative eye care solutions but must do so without breaking the bank. Investing in a femtosecond laser can give your practice the edge it needs to ensure that your practice not only survives, but flourishes. The decision into which laser to choose should not be taken lightly, and all

medical and economic aspects must be taken into consideration. With the continuous evolution of femtosecond platforms now available on the market, finding a laser that fits your needs for versatility, size and mobility are all within reach.

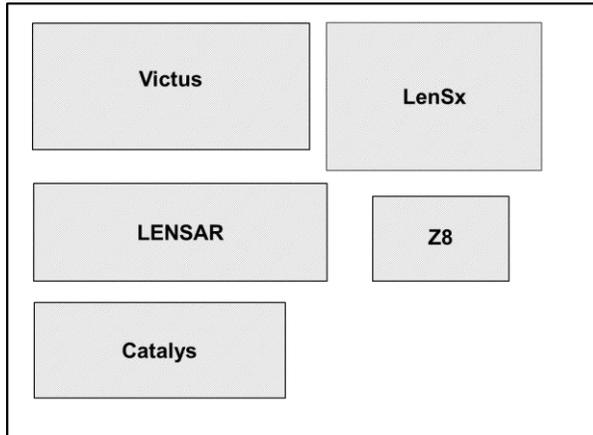


Figure 1. Comparison of femto laser size between the five existing cataract platforms. Actual clinical footprint from static devices not shown but will be much larger, particularly on lasers with fixed patient beds.

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Catalys and IntraLase are registered trademarks of Johnson and Johnson

LENSAR is a registered trade mark of Alpheacon

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Victus is a registered trade mark of Bausch and Lomb

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