Optical Coherence Tomography (OCT), initially developed for high-resolution imaging of the retina, has more recently found application in the anterior segment of the eye. OCT is unique for the front of the eye in that it allows precision imaging and biometry that previously was available only with Magnetic Resonance Imaging (MRI) or immersion ultrasound. OCT also allows patients’ eyes to be imaged in a non-contact manner, which is both practice and patient friendly.

SM² Consulting was asked by Carl Zeiss Meditec (Dublin, CA) to survey and summarize the experience thus far among the first group of customers who have acquired Visante® OCT for use in their anterior segment practice.

Data from both an online survey and live interviews indicate that Visante OCT is providing significant value in refractive surgery as well as cornea and glaucoma diagnoses and treatments. The diagnostic imaging capabilities are aligned with recently introduced technologies including Phakic IOLs and the femtosecond laser for Keratoplasty. Additionally, Visante OCT provides a level of ocular detail that was previously unavailable in an everyday clinical setting. This allows the physician to have an “offensive” strategy to assist with surgical planning as well as a “defensive” strategy to document pathology and post-operative complications. The versatility of the OCT platform suggests that over time and with additional functionality, Visante OCT could become a “must have” for anterior segment surgery.

Methodology and Demographics
An online survey was sent to the first 75 Visante OCT customers, and responses were received by 32 of them, a 43% response rate. Of the 32 respondents, 20 practice in the U.S. and the remaining 12 are in Europe. Interviews were conducted with one-third of the respondents to provide greater context and understanding of Visante OCT’s role in the practice. Among respondents, half are either cataract and refractive (41%) or purely refractive (9%). The other half are comprised mainly of multi-specialty (22%) or general comprehensive practices (19%). 27 of the 32 are private clinical practices, with the remaining 5 being institution-based practices. The distribution by the number of MDs in the practice indicates that the device is used in solo, group and large group practice environments. These demographics are summarized in Figure 1.

Primary and Expanded Applications
The most common reasons for acquiring Visante OCT technology are for use in refractive surgery and anterior segment imaging. In refractive surgery, the device is primarily used for post-LASIK flap evaluation (62%), measurement of the residual stromal bed depth (59%) and Phakic IOL planning (56%). Additionally, 71% of respondents indicate they acquired the technology for imaging of anterior segment structures to better understand and describe the etiology of their diagnoses.

What is interesting is how the use of Visante OCT expands and migrates over time and with experience in the practice. This can be seen in Figure 2, which summarizes uses into four categories and then compares the actual usage (once in practice) with the planned usage at time of purchase. While the majority of practices purchased the device to assist with anterior segment imaging (75%) and/or refractive surgery (94%), many of
those practices eventually began using Visante OCT for use in glaucoma and/or planning of corneal transplants. The majority of practices in the survey now use the device in all four areas. The versatility of the device and its emergence as an “all purpose” tool for anterior chamber diagnostics is illustrated by comments provided by cornea specialists and refractive surgeons. For instance, those who purchased the device primarily for post-LASIK evaluation of the flap and/or residual stromal bed depth have begun using it routinely with pre-LASIK consultations. As one practice explained, “We use it with every single consult; it’s truly helpful and has a ‘wow factor’ that impresses patients, one of whom described it to us as a ‘catscan [sic] of my eye.’”

Ease of Use and Impact on Patient Flow

An important factor with any new technology is evaluating how easy it is to use in everyday practice. Several questions were asked to assess the ease of use among technicians and physicians, which are summarized in Figure 3. In the survey, 91% agree (somewhat or completely) that Visante OCT is easy to use, while only 3% disagree with this sentiment. And 72% feel that any technician can get good images, while 24% disagree and continue to rely on a specific technician to generate quality images. When it comes to interpretation of results, 91% agree it is easy to use and no respondent disagreed.

Assessing the impact on patient flow yielded similarly positive findings: 74% of customers felt that the device had no or minimal impact on patient flow, while only 6% stated that the device had a significant impact on the movement of patients through the clinic (see Figure 4). The findings from both of these areas indicate that Visante OCT is easier to incorporate than similarly advanced refractive diagnostics such as wavefront, where surgeons generally report a significant impact on clinic flow coupled with reliance on a single expert technician to get sufficient results for ablation planning.

Frequency of Usage and Financial Considerations

As described earlier, usage of Visante OCT often begins with a single purpose in mind by a single surgeon (who typically “championed” the purchase) and then migrates to other uses within the practice once other clinicians observe the ease of obtaining images and see the quality of the images, many of which have never before been available to the clinician. As shown in Figure 5, Visante OCT is used on average 11.5 times per week across the survey sample. In contrast with a normalized bell-shape distribution, the frequency of number of practices along the continuum based upon usage was fairly evenly spread out. Although not directly measured in the survey, interview comments indicate that the device gains significantly more use over time. “When we first got the device, a lot of our physicians were scratching their heads and we lacked a process to order the tests,” commented one university-based corneal specialist. “Now, I don’t know what I’d do if they took it away. I’d feel like I lost my left hand.”

Most new diagnostic devices gain a market presence only after reimbursement has been well-defined by third-party payors. In the case of Visante, early adoption is being driven in spite of the lack of a defined reimbursement pathway (ie, there is no specific reimbursement code in place). This is because Visante is being used both in refractive self-pay procedures (where there is no reimbursement as the test fees are typically included in the over-
all fee) as well as in diagnosis of disease. The framework to show how the device is being used is illustrated in Figure 6.

To date, only 15 of the 32 respondents indicated they had sought reimbursement, and they have done so in one or more of the following ways: Private insurance: 73% (11 of 15), Government insurance: 87% (13 of 15), Patient self-pay: 53% (8 of 15).

The frequency of submission of claims and the average reimbursement reported in the survey were analyzed and are summarized in Figure 7. Customers reported submitting an average of 17.8 claims each month (ranging from a low of 8 to a high of 25) for reimbursement. On average, Visante OCT images were reimbursed at $60.14 (ranging from $30 to $120). In Europe, by comparison, reimbursement seems to be averaging in the range of 80-85 Euros per claim. Multiplying the average number of submissions reported yields an average monthly revenue from Visante OCT reimbursement of $1,071 in the US and 1,765 Euros in Europe. These rates are indicative of what can be achieved early on and should only increase over time, especially once an official reimbursement pathway is defined in the US.

Given that the majority of use has been in non-reimbursable elective refractive procedures, the fact that disease diagnosis can help cost justify the device is a positive for the clinician. Using the data in the survey as a baseline, it appears that the device will break-even over a 5-year period (useful life for a diagnostic device). With increased reimbursement revenue from a formal code, greater usage, or both, the time frame for paying back the investment will be shorter.

Satisfaction

Among respondents, 29 of 32 (91%) indicate that Visante OCT has met their expectations based on their initial reasons for purchase. Given the additional usage that most customers have realized beyond those initial reasons for purchase, it is no surprise that in measures of overall satisfaction, 22 of 32 (69%) reported being either very or extremely satisfied while only 1 customer (3%) expressed some dissatisfaction.

Frequently mentioned as reasons for satisfaction were the high image quality and resolution (15 mentions), ease of use (14 mentions), and pure amazement that they now had a device able to capture these images within a clinical setting (10 mentions). There were 9 out of 32 customers in the survey (28%) that indicated they were only somewhat satisfied, citing that they were hoping this device would replace older technology they already owned (e.g., the Orbscan). Other comments from this group included their desire to see Visante OCT upgraded with better software to extract data that is being collected, the incorporation of corneal curvature/topography, and imaging capabilities that extend behind the iris to precisely image the sulcus and the lens equator.

Customers were also asked how they respond to other physicians who are considering the device for their own practices. 85% of respondents indicated they either completely agree (53%) or somewhat agree (32%) that they would willingly recommend Visante OCT to their colleagues. Only 2 of 32 respondents somewhat disagreed and no one completely disagreed with this sentiment. The distribution of responses to these two questions on satisfaction is summarized in Figure 8.
Discussion

The rapid rate of innovation in the ophthalmic sector has forced clinicians to continuously evaluate new devices and ask themselves two basic questions: “Will this tool help my practice?” and “Can I afford to incorporate it?”

Visante OCT provides capabilities that heretofore never existed; its images fall outside the current paradigm of how the anterior chamber is evaluated. This helps explain the dichotomy seen in the data and interviews, with some customers saying “this is a neat device and I’m still trying to figure out all it can do” while others express that “I use it everyday on nearly every patient.”

As a sophisticated diagnostic tool, Visante OCT’s arrival is timely based on the following surgical developments:
1) Increasing awareness and need to reduce the risk of ectasia in LASIK.
2) The advancement of Phakic IOLs as another tool in the refractive armamentarium.
3) The revolution in corneal transplantation afforded by the femtosecond laser and its role in keratoplasty.

With time and exposure, anterior segment Optical Coherence Tomography is likely to move into the mainstream. Today it sits with the “innovator” clinicians, who tend to be the very first to adopt new technologies, simply because they are available. The situation is reminiscent of corneal topography 15 years ago; it was viewed as a “nice to have” but the mainstream clinician was not clear on its utility. All of that changed with the advent of the excimer laser, and today corneal topography is indispensable to the refractive surgeon. With the 3 surgical innovations cited above (and likely many more to come), it is reasonable to expect that OCT technology will improve and become more vital to refractive, cornea and glaucoma specialists.

With respect to the second question posed above, the traditional view has been to evaluate each new technology based upon the opportunity for insurance reimbursement. Given its relative newness in the marketplace, it was surprising to learn that nearly half the customers surveyed were already obtaining reimbursement revenue. For new technologies, it can take several years to establish new codes and rates.

Visante OCT has an additional benefit of indirect reimbursement as part of a larger global fee for specific refractive procedures. These tests are embedded in a larger suite of services provided as part of the refractive package, collectively performed to drive better outcomes in these self-pay procedures.

The emerging definition of reimbursement incorporates the trend towards elective medicine, where patients themselves pay rather than wait for someone else to cover the expense – for the benefits of novel medical technology. Given this shift, it was surprising to see that only a small percentage of customers leverage the presence of Visante OCT in their practice. Less than a third (9 of 32) regularly show off this “new technology” to their patients, and the majority (19 of 32) say they have observed no marketing value from the technology. In hindsight, the question would have been better asked as, “have you created any marketing value for your practice?” There are numerous means of describing the device that can be implemented nearly free but can have a big impact on patient perception of the practice. One surgeon described this phenomenon very well: “Patients love all the tests and Visante has become a practice builder. We tell them, ‘good news, there’s room for your implant’ while we show them the images.” That moment becomes a differentiated event in the mind of the patient and demonstrates how a new technology can create great return on investment for the practice.

In summary, Visante OCT technology has the potential to revolutionize the way surgeons plan and treat throughout the cornea and anterior segment. Customers are largely satisfied and also want to see the technology improve in order to be more useful to them as well as evolve to standard use among cornea and refractive specialists. The manufacturer (Carl Zeiss Meditec) has a heritage of innovation in automated diagnostics, and Visante OCT provides another opportunity for the company and its customers to create yet another market category that improves patient care.