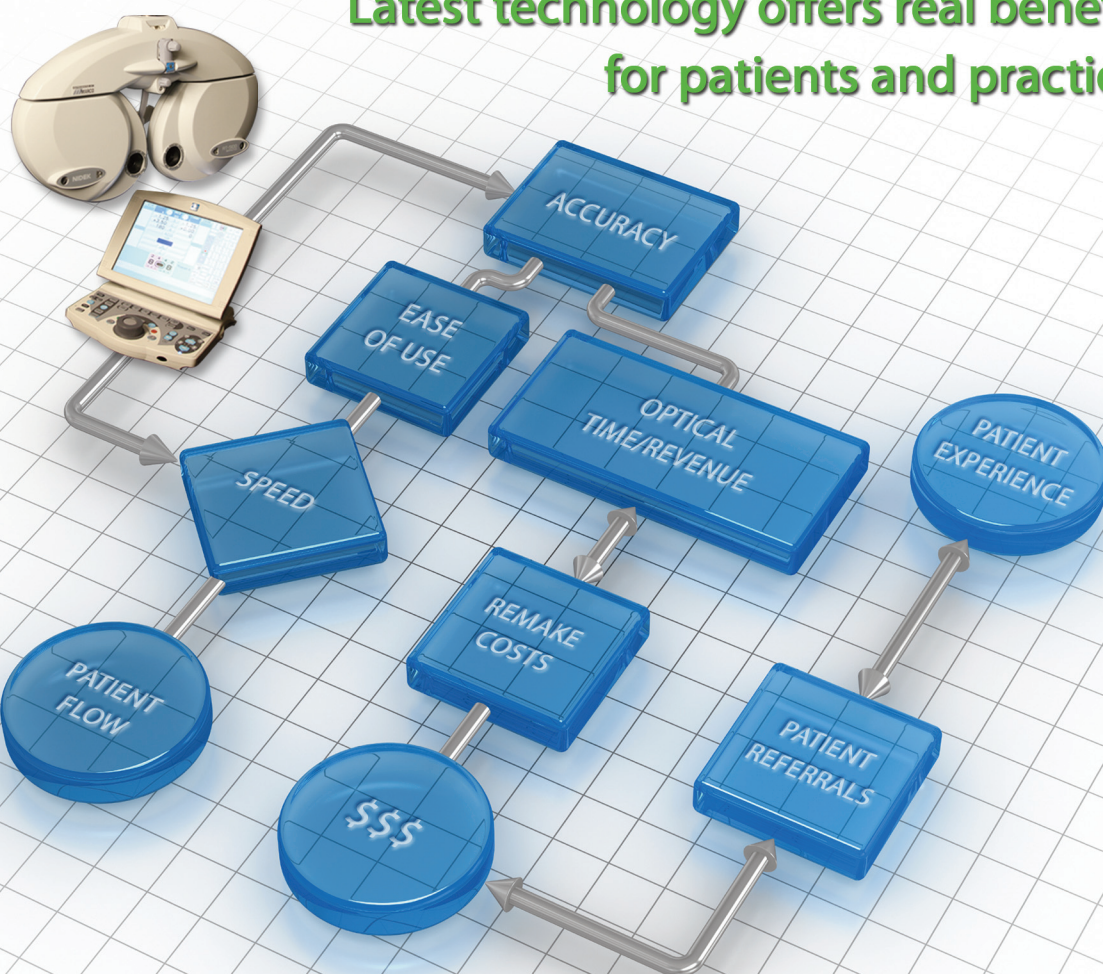


REFRACTION: Making it your business

Latest technology offers real benefits
for patients and practices



Contributing Faculty: Scot Morris, OD | Ben Gaddie, OD | Paul Karpecki, OD



INTRODUCTION

In the end, and in the beginning for that matter, the ability to succeed in clinical practice is all about having an efficient business model. There are many ways to accomplish this, such as increasing your staff, decreasing patient hours and compacting patient hours into a smaller schedule. But the best way would be to increase the speed at which you can see your patients without losing the “personal touch” and still having time to educate and sell your consumers the correct visual solution.

Bill Gates said, “The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.” This supplement wasn’t written to say that technology of any sort will automatically improve

efficiency. However, if your practice is willing to make a few changes, technology can not only make you more efficient, but also make you more productive and a better clinician.

Before we go too far though, we need to get our “minds right.” There are concepts in this supplement that may take a few minutes — and an open mind to understand how this technological change will apply to your practice and make it more effective and efficient. We’ll break this discussion into a few sections to answer these questions:

- How will the correct refractive system impact the overall efficiency of patient flow through my office?
- How will this system impact my level of service?
- How will a specific refraction system impact my practice financially?

Finding a Better Way

by Scot Morris, OD

I had to figure out a better way to increase my efficiency, so I took a detailed look at where the bottlenecks were in my practice. I was surprised to find that I was the biggest bottleneck and, more specifically, refraction was the single, longest time drain in the process. So, how could I shorten the time gap of prescription determination without sacrificing quality? I also wanted to find a way to increase my efficiency so I could spend more time “running my business” instead of having my clinic schedule run the business. After all, at the end of the day, I’m responsible for marketing, operations, human resources, purchasing and strategic planning. Bottom line: I needed more time to build my business and elevate patient care.

I began examining ways to improve clinical efficiency. I evaluated diagnostic refraction systems but I was hesitant. After all, I felt confident performing refractions and it didn’t cost me anything. Why would I want to invest money for a machine to do a “test” that I could perform for free?

But then I considered, was I actually doing it for free? I then looked into all of the information that was being gathered by me or my techs to come up with a refraction. I began to analyze the physical space those devices occupied. As I went through the process, I realized that 25% of my clinical space was occupied by a series of diagnostic devices.

Next, I assumed the role of a patient and went through an exam process in my office. I got a pretty good workout getting up and down, and moving from one machine to another. The process was inefficient and unpleasant. Then at the end of it all, as the practitioner, I had four different sheets

of printouts to put together and enter into my EHR system. And guess what, I made a mistake entering my own data! That’s when I had an epiphany: the way I learned long ago is simply outdated. If I was going to improve my consumer’s experience, I needed to do something drastically different.

So, I bit the proverbial bullet and purchased a diagnostic refraction system for our office — the OPD-Scan III — and I was pleasantly shocked. (The OPD III is an autorefractor, keratometer, pupillometer, corneal topographer and wavefront aberrometer all in one.) Within 2 weeks, we cut 4 minutes off of our professional exam times by delegating the combined lensometry, autorefraction, topography, aberrometry, manifest refraction and add determination. All the numbers automatically populated the correct areas of our EHR program.

Even more surprising were patient responses. They complimented us on being technologically advanced. They commented on how much simpler the entire exam process had become. They said they “had fun” with the refraction process! Because I was spending more quality time with patients, they thought I was spending more time with them and they felt more satisfied with the interaction.

In the 18 months since I made this purchase, I’ve heard these comments on a daily basis and seen social media surveys that support the positive patient response.

I found a better way, and a competitive advantage over the competition. I can work faster, obtain more information, see more patients and still have more perceived time with them. Are you ready to make that type of change?

paying exams per week
hours available to see patients

=

Professional compensation per patient
(Average is \$80 per hour)

EFFICIENCY

In today's competitive market, it's increasingly difficult to increase revenue flow and profit margins. Managed care dictates what others think we're worth (and we allow it). Consumers are ever more conscious of both their time and the value they can negotiate. We can cut costs by reducing services, staff, inventory and salaries or we can increase revenue by seeing more patients or charging more for goods and services. Time is precious and very limited, so staying at the office longer to see more patients isn't a practical solution.

Increased efficiency means greater throughput (seeing more patients), and more time to discuss personalized options for eye wear (doctor-driven dispensing). This can lead to a more effective use of the doctor's time and the patient's time, which can lead to more effective education and more profitable selling. Operational efficiency can also reduce human transcription error by utilizing an automated system that feeds visual data directly into many EHR programs. For example, what's the cost of one remake, both in terms of the actual remake costs and the loss of patient confidence?

What's the cost of doing what you're doing now? Are you overwhelmed? Are you busy? What do you consider busy? Are you busy or inefficient? Don't take that question the wrong way. In your practice, how many people are you seeing per hour? Don't guess: calculate it.

How many paying exams did you see this week? How many hours were you open to see patients? Divide the answer to question 1 by the answer from question 2. Now what are you being compensated for your professional time for an average patient for your professional services? On average, you're probably making around \$60 for a non-contact lens patient and around \$110 for your contact lens patient. Remember this is revenue — not profit. Let's estimate and say you're collecting around \$80 in professional services per patient encounter. If you're seeing one patient per hour, then you're generating about \$80/hour. Product sales (glasses and contact lenses) are generated by the retail part of your business, so we're not counting that right now. If you're happy making the number you just calculated, then great. You may not need to read on. For the other 98% of doctors out there, keep reading.

Once again, to improve this number, we must be able to generate more revenue per patient or see more patients,

more efficiently. This is often referred to as "improving throughput." In the process, hopefully you'll improve optical capture, merchandise sales and better utilize your human resources. In other words, your practice will become more efficient and use this "found" time to do a better job selling, promoting and educating your patients, who are also your consumers. You may just find that your profitability increases, too.

Or maybe you could use your newfound time to put on your CEO hat and build a better business model. If you're seeing 12 patients a day and you save 4 minutes during an exam, you just "found" 48 new minutes in your day without staying one minute longer. You could spend this time making a few phone calls, developing a marketing campaign to bring in new patients, setting up a talk at the local chamber of commerce, or even training your staff on how to sell better.

Note that things will change in your office. It may be difficult at first, because you'll likely wander around for a bit between patients for the first few weeks. You may have extra space that used to be filled with a multitude of different devices (the functionality of which is all handled now by your OPD III) diagnostic equipment, or tables and chairs, that's now empty. It may feel strange. You may have to move a few things around to fill in the empty spaces. As you walk around though, continue to think about how a patient (consumer) experiences your office. Is less clutter good? Is getting up and down and moving from room to room conducive to the consumer having a better experience?

CLINICAL CARE

Within the last decade, technology has changed the way we look at the retina, the optic nerve and the cornea by integrating digital photography, SLOs and topography, respectively, into our practice. EHR systems and various diagnostic technologies are also shaping the way we "see" our patients, in terms of clinical efficiency and business intelligence. Due to changes in healthcare, our profession will need to see more patients, more efficiently in order to survive on increasingly smaller reimbursement schedules. Technology utilization will play a critical role in this survival process. Though many may consider this heresy, we, as optometrists, can't afford to continue seeing a patient from the history-taking stage, through pre-testing, refraction and the remainder of the



What's in a refraction?

It is a subjective process, influenced by many factors. Ambient lighting, the status of the projection system, the cleanliness of a mirror system, the length of a room, the doctor's cognitive awareness during the exam, the patient's cognitive awareness during the exam, the doctor's experience and the patient's previous experiences all play a role in the ultimate outcome of the "test." In other words, there are a ton of variables. Eye doctors everywhere try to control as many of these variables as possible. We refract in a dark room to enhance contrast. But how many of our patients use their eyes all day in the dark?

Refraction also has a cost and ROI associated to it. Most doctors take about 4 minutes to perform a refraction. It can take 8-10 minutes to gather the pretest autolensometry, topography, autorefractometry and so on. So at 12 minutes x \$50 an hour, the refraction costs you about \$10 per hour. Most practices charge in the range of \$20-\$50. Not a bad ROI.

exam as we've done in the past. This traditional approach is incredibly inefficient.

It's time to face the reality that diagnostic refracting systems are more accurate than we are with a standard manual phoropter because they give us tenfold more information in less time, and they take the guesswork out of many procedures, allowing us to delegate these tasks to capable, well-trained staff members. Every task you can delegate leaves you more time to do what you were trained to do: interpret and utilize data to treat your patients' visual and medical issues. Think of it this way. When was the last time you went to your physician's office and the doctor checked your height, weight and blood pressure?

Let's consider all of the diagnostic information that refracting systems of today can collect. In addition, when utilizing this technology, how can one quantitatively assess the function of the refraction versus anterior segment pathology on the overall visual status of the eye?

Wavefront Aberrometry. Ever wonder why some people just can't see 20/20 or have almost no prescription, yet report that they experience glare or starburst at night. With a traditional manifest refraction, it's impossible to

specifically determine higher-order aberrations such as coma, spherical aberration and other higher-order issues, such as trefoil, that lead to these common complaints. Even though a doctor may not be able to treat these issues with spectacles, providing an explanation of the medical reason behind the issue is often all it takes to satisfy a patient. By diagnosing the problem, you've gained a leg up on others who may have ignored or dismissed patient complaints, or worse, tried to prescribe a solution that wasn't really a solution at all. Furthermore, it allows a doctor to know specifically which patients have elevated higher-order aberrations, so they aren't spending 20 minutes trying to refract them down to 20/20 which may not be possible.

Point Spread Function/Zernike Graphs. By providing patients with the ability to visually observe their distortions, patients gain confidence in your ability. They often say the image is exactly what they see at night — and until this point, no doctor has been able to show this. The provider is also able to show the patient the effect of correcting their distortion by showing a point spread function graph. Even more impressive is that the provider is able to ascertain how much of the higher-order distortion is coming from the cornea versus the internal eye. This, in many cases, helps facilitate the discussion about cataract surgery timing or conversion to rigid gas-permeable (RGP) wear.

Day and Night Rx. Think about the fact that we, and our patients, spend most of our lives in lighted conditions and yet we, as doctors, refract with the lights off. Are we solving our patient's issues?

In a study done by Dr. Morris that compared the daytime and nighttime prescriptions of 42 patients, he noted that the average prescription difference between a refraction with the lights on and the lights off was -0.67 - 1.12×10 .

So, what should we prescribe to give our patients the best prescription for the majority of their day? If we give a person their best scotopic (dark illumination) prescription, we're causing them to over accommodate all day. Maybe it would be better to give them their ideal indoor daytime prescription and prescribe a separate pair of glasses for night vision.

In addition, the study showed that with automated refraction technology, it was possible to show consumers their current Rx, their new daytime Rx and their new nighttime Rx, so patients could select the best option for

Table 1. Standard 10-year depreciation rates

Year	Annual Note*	Annual Payments	Depreciation Rate	Depreciated Value	Total Expense
1	\$49,167	\$13,587	10%	\$6,000	\$7,587
2	\$37,779	\$13,587	18%	\$10,800	\$2,787
3	\$25,809	\$13,587	14.4%	\$8,640	\$4,947
4	\$13,267	\$13,587	11.52%	\$6,912	\$6,675
5	\$0	\$13,587	9.22%	\$5,532	\$8,055
6			7.37%	\$4,422	-\$4,422
7			6.55%	\$3,933	-\$3,933
8			6.55	\$3,933	-\$3,933
9			6.56%	\$3,936	-\$3,936
10			3.28%	\$1,968	-\$1,968

* 5 years at 5% for loan origination of \$60,000

their needs. This resulted in a 24% increase in single-vision night driving eyeglass sales.

Pupillometry. Related to the night vision issues is the ability to ascertain photopic and mesopic pupillometry. Not only is this helpful for pre-operative refractive surgery but it also can be important in determining what multifocal lens or RGP lens design may be best suited to provide the best visual solution for an individual patient.

Anterior Segment Disease. Diagnosis of anterior segment diseases has been made simpler with the Marco OPD-Scan III retro illumination device. Early lens changes affecting a patient's visual system can be detected, allowing for the earliest diagnosis possible, and it can aid the patient in visualizing the cause of his reduced vision or nighttime vision issues.

Corneal Topography. Corneal topography can be used to diagnosis ocular surface disease, and for pre-operative and post-operative assessments. Like many other systems, topography is increasingly useful in RGP fittings. For complicated fits, saving the image file and sending it to the manufacturer for consultation can simplify the process. This dramatically saves chair time by reducing the number of follow-up visits and refits.

Ultimately, the diagnostic capabilities of automated refracting systems not only aid the doctor in ascertaining a more comprehensive picture of the total visual system but also help to provide a more clear and concise explanation to the patient.

FINANCE

As discussed earlier, to run a great business, we have

to justify any expense that affects our bottom line. This part of the piece will focus on the potential expenses and the profit associated with the investment in automated refraction technology.

We start with the expense side. There are three potential ways to break down the expense discussion. First, we think like accountants and break this process down into numbers that we can deal with on a daily or monthly basis. Let's first assume the standard 10-year depreciation rate (See Table 1). Though your equipment will probably have a longer lifespan than 10 years, we'll use the standard numbers. Your accountant may have you on a more aggressive rate than the standard MACRS rate but we'll stay with the standard for this exercise. Most of the basic EPIC packages are going to cost you somewhere in the range of \$60,000. Note that we're not including any interest rate you'd be charged if you choose to finance the equipment purchase but, as you can see in Table 1, any interest payments will be more than compensated by the depreciation write-down.

Second, we can break the non-depreciated value into a monthly value over a 5-year note at 5%. So, \$60,000 is approximately \$1,132.27 per month with a total payment including interest of \$67,936.20. The annual payment would be \$13,587.24. Let's go one step further and break this down into true cost per day before depreciation expenses. We assume 20 clinic days in a month, so we're talking about \$56.61 per business day. Here's our "big" number that we need to clear in increased profit every day to be able to afford this new piece of equipment (not taking tax depreciation into account).

OPD-Scan III: Better Ergonomics, Lower Risk for Damaged Discs

In a recent survey of 1700 Australian optometrists, 82% of doctors reported work-related physical discomfort, primarily in the neck, shoulder and lower back.¹ I always assumed some discomfort was normal, but at 42, I thought I was relatively young to experience cervical disc problems. My diagnosis — a ruptured disc and a herniated disc — came as a big surprise.

Although certainly not the cause, my 15-year occupational history of repeated overhead motion while sitting and raising my arms to perform refractions, probably contributed to my problems. Suddenly, I began losing sensation along several fingers in both hands. A month later, I began to lose strength in my arms and hands, even lacking the strength to hold something tightly in my left hand.

An MRI showed a ruptured disc at c7 and significant herniation on c6. The surgeon said I needed surgery immediately, so I had it the next day — a discectomy at c7, spinal cord decompression, and a bone graft/fusion of c6 and c7. Immediately after surgery, I could

feel my hands again. I was out of work for nearly 3 months, recovering from surgery, strengthening my body and re-mastering my fine motor control.

When I returned to work, I didn't want to use a manual phoropter, so I bought the Marco OPD-Scan III system. My staff and I trained on it for about a day, and I moved all my refractions over to the TRS 5100 refraction system. Using this system exclusively has led to better patient flow, increased precision in refractions, increased profitability and reduced risk of transcription errors.

What's more, the ergonomic features have eliminated my overhead arm movement. The console platform for the refraction is waist high. I operate it from a chair and simply turn one dial and push an occasional button. If you've experienced any neck or spine problems — or just want to avoid them — I recommend the OPD-Scan III and TRS 5100 combination refraction system.

— Ben Gaddie, OD

REFERENCE

1. Long J, Naduvilath TJ, Hao LE, et al. Risk factors for physical discomfort in Australian optometrists. *Optom Vis Sci.* 2011;88(2):317-326.

We could even go so far as to break it down by patient and include it into our “chair time” equation. If we assume the average optometric practice has 12 vision exam patients per day, we're looking at \$4.73 per vision exam patient.

Now let's talk about the income side of this equation. There are five potential ways to improve your net income or overall probability by utilizing this type of technology.

Fewer remakes

The first and most obvious place we noticed a measurable difference was in the reduction of our remake issues related to transcription errors. They went from 4% and an annual remake cost of \$12,412 to ZERO. The OPD III tied into our EHR system, which was able

assuming a similar remake frequency each year over a 5-year period), our monthly measurable savings was \$1,034 or \$4.31/patient.

Increased sales of new primary eyewear & increased sales time

We were curious as to how this new refraction system would change our workflow, and more importantly, how it would increase our sales. The most wonderful feature about the EPIC system is its ability — with just the quick turn of one dial — to alternate between a patient's current prescription and the “new and improved” prescription. We've always found it hard to tell a patient their prescription has changed, regardless of how much it changed. Now we have the ability to show them, while setting their expectations. This allows them to choose which prescription they feel they see better with. About 17% reported that they had better vision with their old prescription; 21% said the scripts were about the same (and half of those purchased glasses anyway but we won't count them). The remaining 62% reported that they preferred the new prescription. This was surprising to us because many of them only had -0.37 spherical equivalent difference but they perceived that their vision was better.

**Money saved by eliminating remakes
= \$12,412 / year or \$1,034 / month**

to send the prescription information directly through vision web, allowing us to eliminate any opportunity for transcription errors. So, in our real-life example (and

It's hard to estimate how many of those patients would have purchased new glasses anyway, but we noticed a 36% increase in optical profit during this transition phase. In our practice, this was an \$18,152 increase in PROFIT in the initial 3-month period. Annualized, we saw a \$72,608 increase in profitability or approximately \$25.21 increase in PROFIT per patient.

**Increased annual sales of eyewear
= \$72,608 or \$25.21 / patient per year**

Second pair sales (computer Rx)

Once we began to understand the capabilities of this device, we began checking the prescriptions of all patients who spend more than 4 hours a day in front of a computer.

We began to realize that we were assuming patients would use their distance prescription effectively and without symptoms or problems for prolonged intermediate viewing. When we questioned our moderate to heavy computer users, we identified that they were spending a significant portion of their days at 24-38 inches. We began performing a separate refraction at their working distance to determine their intermediate prescription.

With a turn of the dial, we could show patients their current prescription, their “new” general-purpose prescription, and their “new” computer prescription. We simply let them choose which lens was best for intermediate use. We then explained that just as they may need a different pair of shoes for work, they may also find it beneficial to have a specific pair of eyeglasses for work.

**Second pair sales (computer Rx)
= \$13,664 / year or \$4.74 / patient**

We tracked the results over the next 3 months and found that our second pair occupational sales increased dramatically. We had a \$3,416 increase in optical profitability — not just sales but actual profits. We found that about 8% of our patients chose to

purchase an occupational pair of eyeglasses once they were able to “see” the difference versus us telling them there was a difference. As you noticed, it was only 8% and maybe we could have pushed harder and made that number go into the high teens but we were happy with our new income stream. Though we didn't track this number over the remaining 9 months following our purchase of the OPD III, we extrapolated and our numbers were somewhere in that vicinity for the remaining months, so we'll use this annualized number of \$13,664 (or \$4.74 per patient) for our calculations.

Second pair sales (night driving Rx)

After our experience with occupational lenses, we began to wonder what else we'd been missing. We routinely ask patients if they suffer from visual issues while driving at night. About 12% of them report nighttime driving issues, which caused us to rethink how we were obtaining refractions. Traditionally, we refract with the lights off in the rooms to enhance contrast. But most patients spend most of their days with the lights on. So, we began looking at those individuals who had nighttime vision complaints and noticed that they had significantly different photopic and scotopic OPD refraction readings. We began refracting people with the lights on, and then again with the lights off. We then turned the lights on and demonstrated their current Rx,

**Second pair sales (night driving Rx)
= \$4,612 / year or \$1.60 / patient**

and then showed them their “new” Rx and let them judge which was better. Then we shut the lights off and asked them which they preferred — “lights on” prescription or “lights off” prescription. Once again, we showed them, we didn't tell them. Many of these same individuals had an average difference between scotopic and photopic refraction of -0.67 - 1.12×010 . We discussed if they would be interested in seeing as well at night as they do in the daytime. We explained that for a small percentage of people with nighttime issues a different pair of glasses, especially with anti-glare, could enhance their vision. Then an interesting thing happened. Just a little under half of them (44%),

$$\begin{array}{ccccccc}
 \$12,412 & + & \$72,608 & + & \$13,664 & + & \$4,612 & = & \$103,296 \\
 \text{remake savings} & & \text{increased eyewear sales} & & \text{2nd pair sales} & & \text{2nd pair sales} & & \text{measurable increase in} \\
 & & & & \text{computer Rx} & & \text{night Rx} & & \text{annual income}
 \end{array}$$

decided to buy single-vision night driving glasses as a second pair. This included contact lens wearers and traditional spectacle wearers. This led to a PROFIT increase of \$1,153 over the next 3 months. So once again, extrapolating these numbers over a year's time, we get a profit increase of \$4,612 or \$1.60 per all patients. Even better was how many thank you notes, phone calls and referrals we received from patients who could "finally see" at night.

Intangibles

It's more difficult to measure the intangibles, so we won't try to estimate or put a value to this process, but for completeness sake we want to mention them. We were growing very quickly and in need of a third lane, or so I thought. As was discussed in the efficiency section, we purchased our system because we realized that our bottleneck was the refraction. But by having the refraction take place in the lane, we were tying up a lane that could be used to see other patients. So we moved the OPD III out into the pre-test area. We estimate that a third lane build complete with construction costs, new chair, new stand, new phoropter, and all the other lane accoutrements would have cost us about \$51,000.

Even more impressive — we cut about 4 minutes off of every vision exam time. Though it could be argued that we could have seen another 2-3 patients a day with this "newfound" time, we chose to spend more time educating patients about visual issues and the variety of solutions that we could provide to enhance vision.

If we use the average of \$306 of revenue per patient (according to the 2011 MBA), we could have generated another \$600-900 per day. We've slowly increased our

numbers but as discussed previously, we were pretty happy without increased profit per day without having to see more patients. We now can easily see 18 plus vision patients per day plus the 8-12 medical visits and another 6+ contact lens checks every day.

Last intangible note: there's no reliable way to measure how many patients we retained or how many referrals we received because of our "high tech" image. We have many other pieces of innovative technology in our practice, so we couldn't attribute any particular value to just the automated refracting systems. That said, it's still a daily occurrence when a patient says, "I'm so glad I don't have to do that 1 or 2 test; I hate that even more than I hate the glaucoma test (tonometry)."

Income summary

Adding the first four points together, we increase our bottom line profitability by \$91,918 or \$31.92 per patient. Contrast that with the actual expense per patient (not including the tax depreciation) of \$4.73. We saw an estimated increase in profitability of \$27.19 per patient. In these days of managed care, that is significant.

CONCLUSION

Yes, automated refraction systems are different from what you're used to. And yes, automated refraction systems have an initial expense that can be overwhelming, but as we've shown, they more than pay for themselves in a short amount of time while creating a better quality of professional life for you, your staff and your patients. Yes, you're missing things if you're still practicing with a standard topographer and a phoropter. Remember, change can be challenging but it's worth it in the long run.

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Editorial Staff

EDITOR, *OPTOMETRIC MANAGEMENT*: Scot Morris, OD, FAAO
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CONTRIBUTING EDITOR: Erin Murphy

Design and Production

PRODUCTION DIRECTOR: Leslie Caruso
PRODUCTION MANAGER: Bill Hallman
ART DIRECTOR: Michael F. Higgins

Editorial and Production Offices

323 Norristown Road, Suite 200, Ambler, PA 19002
Phone: (215) 646-8700

Business Staff

GROUP PUBLISHER: Roger T. Zimmer
SALES: Dawn E. Schaefer & Scott Schmidt
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