

Performing refraction

Computer versus traditional

By Ron Rajecki

Reviewed by Neil B. Gailmard, OD, MBA, FAAO

New York—Computerized refraction is growing in popularity, and for good reasons. Speaking at International Vision Expo East, Neil B. Gailmard, OD, MBA, FAAO, explained why.

- A strong “wow factor” with patients.
- It enables a quick comparison between the old prescription and new prescription.



Dr. Gailmard

• By interfacing with an autolensometer, it provides an automatic starting point for an examination.

• It allows for the easy transfer of data from the examination to the patient’s electronic medical record.

• It offers comfortable ergonomics, thus minimizing the physical strain on the optometrist performing the exam.

“Twenty years from now everybody’s going to be performing electronic, computerized refraction,” said Dr. Gailmard, president of Gailmard Consulting, Munster, IN. “It has a lot of advantages over the traditional mechanical phoropter.”

In many cases, the ease of computerized



Dr. Gailmard and associates trained clinical technicians to perform computerized refraction using a system similar to the one shown here (EXAM-5000 refraction system, Topcon). (Photo provided by Topcon Medical Systems Inc.)

refraction has led optometrists to train their technicians to perform refractions (under doctor supervision) in states where such an option is permitted. Having technicians perform refraction saves the doctor time, increases the practice’s production, and helps develop a staff with higher skill levels.

But technician refraction with a computerized refractor isn’t optometrist refraction with a phoropter—or is it? That was the question Dr. Gailmard set out to answer with a study of 106 eyes in his own practice.

‘The computerized electronic refractor is really just an electronic phoropter. In the hands of a good refractionist, the two methods are identical.’

Neil B. Gailmard, OD, MBA, FAAO

Take-Home Message

In a recent study, technicians using a computerized refractor and measuring sphere, cylinder power, and axis obtained results similar to those obtained by optometrists using a traditional mechanical phoropter.

Dr. Gailmard and his associate optometrists trained 12 clinical technicians on how to perform computerized refraction. The technicians had experience in clinical pretesting but not in refraction. All were trained on his practice’s computerized refraction system (Exam 5000, Topcon).

The results that the technicians obtained were compared with results arrived at by Dr. Gailmard or an OD colleague using a traditional mechanical phoropter (Phoropter, Reichert). The ODs performed refractions on the same patients immediately after the technicians had finished.

Looking at the sphere value of the refraction, 47% (50 eyes) of the 106 eyes had no difference in sphere between the computerized refraction performed by the technician and refraction performed by the optometrist using a phoropter.

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Another 41% (43 eyes) had a quarter-diopter difference, for total of 88% of the eyes having a quarter diopter or less difference in sphere power.

Cylinder power, axis

No difference in cylinder power was found between the technician and physician refractions in 69% of the eyes, while 26% had a quarter-diopter difference in cylinder power.

Differences in cylinder axis were not applicable in the 38% of the eyes in which no cylinder power was found. In eyes in which it was applicable, however, there was no difference between the two refractions in 38%, and a 1° to 5° difference in axis in 26%.

“There are relatively insignificant differences between technicians performing refractions with a computerized refractor and optometrists performing traditional mechanical phoropter refractions,” Dr. Gailmard said. “There was very high reliability of results with technicians performing refractions with this computerized system.”

OD to OD variance

Dr. Gailmard and his colleagues also compared the baseline variance of refractions by comparing the results generated by two optometrists using a phoropter.

“We thought it would be useful to evaluate normal OD to OD variance,” he said. “Here we took 12 eyes and had an optometrist do a subjective refraction with a phoropter, then had a different optometrist perform another refraction on the same day. We found there’s some difference from OD to OD even with the standard phoropter.”

In comparing OD with OD using a phoropter, 42% of the eyes had

no difference on sphere, while 50% had a one-quarter diopter difference. There was no difference in cylinder power in 59% of the eyes, and a one-quarter diopter difference in 33%.

Cylinder axis was not applicable in 33% of the eyes, while 25% had no difference and 17% had a difference of 1° to 5°. These “normal variance” results were comparable to the differences found between computerized technician refraction versus mechanical phoropter refraction performed by an optometrist.

Refraction is not prescribing

“The computerized refractor is basically doing a great job,” Dr. Gailmard said. “At its heart, the computerized electronic refractor is really just an electronic phoropter. They’re both machines filled with a large number of lenses; the only thing that’s different is the way the lenses are moved—electronically instead of mechanically. In the hands of a good refractionist, the two methods are identical.”

Dr. Gailmard added that while optometrists of course want to be aware of and follow the laws of their states, the case for technician refraction using a computerized refractor is a good one. Refraction, however, is not the same as prescribing, he said.

Data collection

“In my mind refraction is just a form of data collection. Collecting the refraction data is a task that could be performed by anyone who’s trained well enough to do it,” Dr. Gailmard said.

“The prescribing of lenses requires a professional,” he continued. “That should be a doctor who’s trained in putting together all the

different factors that go into prescribing, such as the patient’s habitual glasses use, their chief complaint, their occupation, their visual needs, and so on.

“There are many reasons why the lens prescription is not the refraction,” Dr. Gailmard concluded. **OP**

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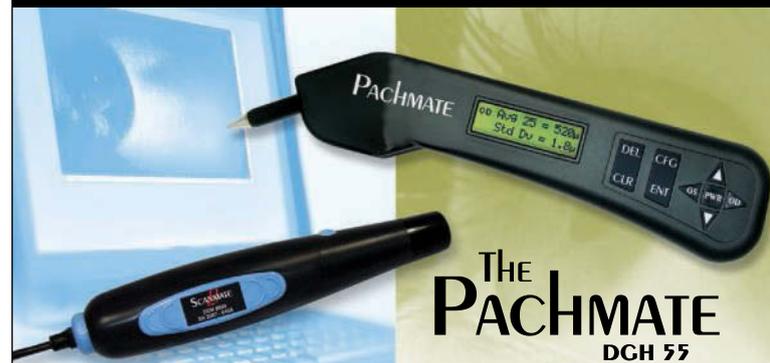
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Dr. Gailmard has received honoraria from or serves as a consultant to Ciba Vision, Essilor, International Vision Expo, and Topcon.

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