At-home IOP monitoring

Tips to design a successful how-to for patients

BY ARIANA LEVIN, MD, BARBARA WIROSTKO, MD, FARVO, AND CHRIS EPPERSON, OMT, AT, ESS-SMS

Intraocular pressure (IOP) fluctuates throughout the day, as well as during the night as we sleep; even body position and Circadian rhythm can cause variations.[1] Typically, practices measure IOP only during daytime clinic hours, but high IOP at night can contribute to disease progression even in cases of normal-tension glaucoma.[2] So, when we miss nighttime measurements, we are missing important data that can help us understand and treat our patients' disease. Making for an even more complicated situation, IOP also varies day to day, and infrequent measurements — such as a single office visit every 3 months — provide just a snapshot of IOP patterns.

To address this issue, the eye-care industry has developed devices to measure IOP at home. The iCare HOME tonometer became available in Europe in 2014 and was approved by the FDA as a prescription medical device in the United States in 2017.[3] A handheld device (like the iCare tonometer used by health-care professionals in clinics), the iCare HOME tonometer enables patients to measure their own IOP.

Another device, the Sensimed Triggerfish contact lens, was cleared by the FDA in 2016. This contact lens is worn by the patient overnight; sensors embedded in the contact lens measure corneal dimensions which are then translated to an IOP measurement. Because our practice has experience only with tonometers, we will restrict our guidance to what practices and technicians need to know as they train patients to use the iCare HOME device.

First, develop a protocol

Practices interested in measuring IOP from a patient's home must first determine how devices will be purchased and distributed to patients. Will the patient purchase and own the device or will the device be rented (either from the device company or a health-care practice)? Will patients put down a monetary deposit for the device? Will insurance be billed, or can a health saving plan cover the cost? For some practices, a research grant can help cover the cost. Also, how will practices guarantee that patients return the device?

Well-established loan programs in other specialties (eg, home blood-pressure cuffs, home Holter monitors) may serve as models for eye-care practices. Our practice is currently working a third-party insurance company to help us bridge that accident gap for lost or damaged devices. iCare offers extended warranties with a deductible to cover that issue as well.

Preparing patients to measure at home

A patient's ability to navigate their device and their confidence in their ability are critical to successful measurements.

Patients should be trained by ophthalmic professionals who know the ins and outs of the device. This can be accomplished through videos, teleconferences, and/or in-person sessions. Our practice utilizes in-person training — we allot 15 minutes for these sessions — and videos. Links on MyEyes.net (the website and device company we founded to facilitate patients obtaining home tonometers) features three YouTube training videos that introduce the tonometer and provide detailed instructions on its use.

Whatever mode of training you choose, make sure it provides instruction on:

- Turning the device on and off
- The function of each of the buttons on the device
- The meaning of indicator lights and sounds on the device
- Keeping the device clean and safe for use
- Positioning of the patient
- Proper insertion of the probe
- Obtaining a measurement
- How to confirm that a measurement was successful
- How to upload and access the data to discuss with the patient's eye-care provider.

Importantly, training should also include troubleshooting for unsuccessful measurements. For example, the iCare HOME must be held by the patient at a particular distance from their eye and at a particular height relative to the apex of their cornea. We find that patients typically need more

AMD monitoring too

By René Luthe, associate managing editor

Glaucoma patients aren't the only group to benefit from at-home monitoring devices. Notal Vision's ForeseeHome AMD Monitoring Program utilizes Preferential Hyperacuity Perimetry (PHP) to detect conversion from intermediate dry to wet AMD through a daily 3-minute test in the patient's home. Once prescribed by a physician, Notal Vision sends the testing device to the patient's home and contacts the patient to provide training on its use. Test results are automatically sent to the Notal Vision Data Monitoring Center. If a significant change from the patient's baseline is detected, the referring doctor's practice receives an email alert that contains a direct link to the patient's report. If a "read" receipt is not received, Notal escalates the alert and phones the practice.

Sarah Casper, COA, OSC, is practice manager at Horizon Eye Care in Charlotte, N.C., which has prescribed the ForeseeHome to patients for the last 2 years. She praises the ease with which it is incorporated into a practice. "All the doctors need to do is identify that patient, which is quite simple for intermediate macular degeneration."

The physician goes through the day's schedule and places a ticket in the chart of patients they think would benefit from the ForeseeHome, Ms. Casper explains. The technician working up such a patient then provides a brochure and explains that the doctor will discuss it further with them — Notal Vision takes it from there. "Notal does all the dirty work: They check insurances, educate the patient, ship the machine, train the patient," she says.

While Ms. Casper can, say, review the basics of operating the testing device with a patient or help them complete a form, any more sophisticated instruction is referred to Notal Vision.

When the practice receives an alert about one of its patients, Ms. Casper contacts them that same day.

"Our protocol is that we need to see the patient within 72 hours," she says. "I explain again that the machine detects any subtle changes in their vision before they see changes. I think it's a fantastic technology."

instruction in obtaining the initial alignment, adjustment of the head and cheek measurement bars, and uploading their data to the clinic software. In-person training allows staff to give patients the extra help they may need.

Should additional troubleshooting be necessary, representatives are often available from the device makers or company renting them out; we provide our patients with the relevant contact information.

Patient education

Be sure to inform patients how and when they will receive their IOP data, as well as how they should act on that information. For example, the current model of the iCare HOME device does not display the IOP on the device (due to FDA regulations); the IOP data are stored in the device then uploaded to the clinic software on the cloud.

Patients' have immediate access to their data on the cloud if they own the device. If, however, patients are renting the device through a third-party such as MyEyes, that data maybe shared with the doctor and the patient in a user-friendly spreadsheet once the rental period is complete.

Innovations to come

The biggest limitation of devices that patients use to measure their own IOP is that they must wake up to measure — so we still miss important data while patients sleep. We might miss high IOP that occurs during episodes of sleep apnea or overnight hypotension (low blood pressure).

Fortunately, surgical implants that measure IOP are now in development. The Eyemate-IO (Implandata Ophthalmic Products) recently earned Europe's CE Mark. The implantable micro-sensor performs continual monitoring of IOP in glaucoma patients.[4]

Current and future home devices can change the way we practice. In-office IOP checks might be reduced; clinic flow and allocation of office resources would change and improve. IOP measurements might upload directly into electronic health records. The ophthalmic professional will interact with IOP in a new and exciting way that can save sight. **OP**

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