



# USING REMOTE IOP MONITORING TO ADVANCE CARE

Home tonometry adds real-world information for  
better glaucoma decision-making

Sponsored by

**icare**  
For better perception

## USING REMOTE IOP MONITORING TO ADVANCE CARE

Home tonometry adds real-world information for better glaucoma decision-making



Barbara M. Wirostko, MD

**A**bout three years ago, I began providing the iCare HOME tonometer to my glaucoma patients and more recently upgraded to the HOME2. Sufficient literature confirms that IOP fluctuates and elevated intraocular pressure (IOP) leads to optic nerve damage resulting in glaucoma progression.<sup>1,2</sup> Over the last 20 years many well-controlled, long-term randomized masked studies have indicated that IOP, a primary risk factor that we can treat, if lowered from its maximum number, can slow down progression.<sup>3</sup> We also know that many patients progress despite having “controlled” IOP in the office. Though other parameters beyond IOP affect glaucomatous progression, the iCare HOME2 enables me to efficiently track pressure variability and fluctuation to better assess the effectiveness of therapies and interventions in patients and determine that maximum IOP.

Knowing that glaucoma is a chronic and progressive disease characterized by fluctuating IOP, I would not be doing my best for patients by relying on one IOP measurement every 3 to 4 months to get a true picture of the disease. Outcomes of other progressive diseases such as diabetes and hypertension improve with better and tighter control, eliminating those fluctuations to slow progression and damage.<sup>4</sup> Toward that end, I want to use the best tools available to regularly monitor patients’ IOP. My iCare HOME and now HOME2 tonometers are poised to help me achieve this.

**"As I continued prescribing the iCare HOME2 tonometer, I found the ability to look at IOP response became just as important as noting spikes once I started patients on treatment or intervened with surgery or lasers."**

**—Barbara M. Wirostko, MD**

### SURPRISING BENEFITS

Initially I used home tonometry to identify IOP spikes and trends outside of the clinic as well as diurnal fluctuations. I thought this would enable me to better deter-

mine peak IOP and set a target based on those pressure swings. As hoped for, the device helped me detect very high pressures outside the clinic. It also reassured me that my ocular hypertensive patients were not spiking or fluctuating at all.

As I continued prescribing the iCare HOME2 tonometer, I found the ability to look at IOP response became just as important as noting spikes once I started patients on treatment or intervened with surgery or lasers. IOP can change over 24 hours but also over months and years, and therapies can become ineffective with long-term use.<sup>5</sup> Not only is the iCare HOME2 extremely valuable as an acute diagnostic device but I find it invaluable for managing the chronic—and sometimes elusive—nature of glaucoma over time especially as we turn to sustained delivery of IOP lowering agents.

### ADVANCING FEATURES

As with all iCare tonometers, measuring requires no anesthetic drops, or other preparation. The HOME2 tonometer received FDA clearance in January 2022. Compared to its predecessor, the iCare HOME2 tonometer has many upgraded features, such as supine measurements, a patient mobile app and a private patient cloud account compatible with Apple, which all have been useful to me and my patients. The software can be configured to send the doctor an e-mail alert if IOP rises above a pre-set limit.

At-home measurements can be uploaded to a cloud database where they are easily accessible to me and my patients. For me, the ability to connect to the cloud-based software using my iPhone is particularly helpful. Based on IOP data I have received from home tonometry, I have changed topical therapy, and recommended surgery or lasers much earlier than in the past when I would



# HOME TONOMETER CAPTURES EARLY MORNING SPIKES

A 60-year-old male patient with advanced POAG came to see me for a second opinion in June 2021. He presented with mild transilluminations in his iris OU, so a pigmentary glaucoma diagnosis was entertained.

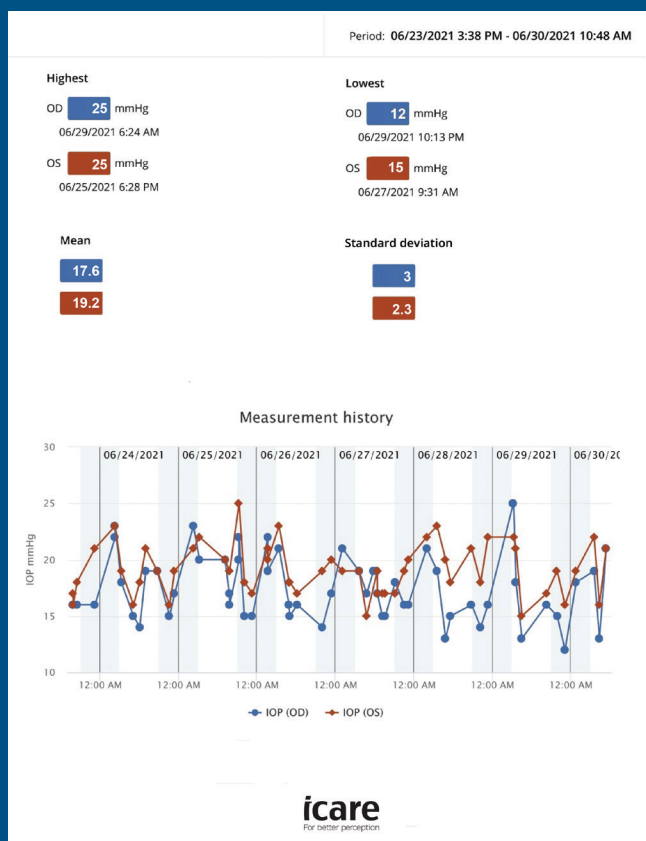
The patient used the iCare HOME to determine multiple occasions outside of the clinic in which his IOP was spiking as high as 26.5 mmHg OU in the early morning hours. On Simbrinza OU TID and Vyzulta OU qhs, the patient's IOPs were 14 and 15 mmHg in the clinic.

In October 2021, the patient underwent a cataract

extraction and partial OMNI iTrack goniotomy OS. Two months later, in December 2021, the iCare HOME revealed spiking to 29 mmHg OD and 22 mmHg OS. Though the patient had a slight reduction of IOP in his left eye, it wasn't significant.

The decision was made for the patient to receive a XEN® Gel Stent in his right eye in January 2022, given more significant RNFL and VF loss in this eye. The iCare HOME graph in Figure 2 from March 2022 shows a marked flattening of IOP OD on follow-up.

Today, the patient's left eye is being followed closely and will receive a XEN® Gel Stent as well.



**Figures 1 and 2.** iCare HOME graph (left) shows the patient's IOP measurements OD and OS June 2021, revealing IOP spikes in some cases outside of normal office hours. The subsequent iCare HOME graph (right) reveals patient IOP readings OD pre-XEN® Gel Stent (blue) and post-XEN® procedure (green). The procedure's successful lowering of the patient's uncontrolled IOP emphasizes the importance of ongoing diurnal IOP monitoring for managing progressing patients. Barbara M. Wirostko, MD

have waited for changes on the visual field with evidence of progression to occur. Recently, my colleagues and I have published research showing patients are responding very differently to the same therapy,<sup>6</sup> meaning glaucoma

management must rely on a more personalized treatment regimen. As such, patient-specific data obtained outside the office is a powerful tool for managing my glaucoma patients. I also find the ability to measure IOP supine to be

## USING REMOTE IOP MONITORING TO ADVANCE CARE

Home tonometry adds real-world information for better glaucoma decision-making

attractive given we often see sharp IOP elevations during the early hours while people are sleeping.<sup>7</sup> The portable device employs a “smart light guide” to facilitate proper alignment and measurement distance. My patients can quickly center the tonometer, take a measurement, and see their IOPs using the iCare PATIENT2 app. This enables patients to follow their IOP trends using iOS or Android mobile devices. I can easily interpret the data and graphs, and the device determines the quality of the data, which gives me extra reassurance about what I am reading.

My patients love the ability to check their IOP outside the office, to track the variability and timing of that variability, as well as how it relates to exercise and daily activities. They are happy with the HOME2’s user-friendly design and how the device has empowered them to better understand their disease.

**"This is the future of glaucoma management—using remote patient monitoring to make real-time decisions that help glaucoma patients maintain control of their IOP and disease for better ultimate outcomes."**

**—Barbara M. Wirostko, MD**

### FAST PROGRESSORS

The iCare HOME2 tonometer is especially important for identifying rapidly progressing patients who may have reasonable IOPs at the clinic. In fact, I started MyEyes LLC to make it easier to get home tonometers into the hands of patients after one glaucoma patient was able to obtain the iCare HOME tonometer and discovered he was having pressure spikes outside of the clinic.

Though the patient’s IOP readings appeared stable during office visits, we quickly realized once we had the home tonometry readings that the patient was spiking during early morning hours. My patient was already on maximum tolerated topical therapy so we no longer needed to wait for progression; we immediately discussed surgery.

At its heart, the iCare HOME2 tonometer enables me to be proactive and hopefully mitigate glaucoma damage. For this reason, many of my glaucoma colleagues have thanked me and MyEyes LLC for working with iCare to

make the HOME and HOME2 tonometers more accessible to patients.

### FUTURE OF GLAUCOMA MANAGEMENT

I see the iCare HOME2 tonometer playing an important role as we start to implement longer lasting drug-eluting devices and implants, as well as a more personalized glaucoma approach. One of my patients, who lives in another state, received a drug-eluting implant. Because he owns his own iCare HOME tonometer, he was able to let me know his IOP was creeping up. I promptly called in a new PGA prescription for him to start taking as the Durysta stent effect was wearing off.

This is the future of glaucoma management—using remote patient monitoring to make real-time decisions that help glaucoma patients maintain control of their IOP and disease for better ultimate outcomes. ■

**Barbara M. Wirostko, MD, is the Resident Research Director and Adjunct Professor of Ophthalmology and Biomedical Engineering, John A. Moran Eye Center, University of Utah, Salt Lake City, Utah. She is the co-founder and Chief Medical Officer of Qlaris Bio and MyEyes.net.**

1. Lee JS, Park S, Seong GJ, et al. Long-term intraocular pressure fluctuation is a risk factor for visual field progression in advanced glaucoma. *J Glaucoma*. 2022 May 1;31(5):310-6.
2. Gao F, Miller JP, Miglior S, et al. A joint model for prognostic effect of biomarker variability on outcomes: long-term intraocular pressure (IOP) fluctuation on the risk of developing primary open-angle glaucoma (POAG). *J P Biostat*. 2011 May 1;5(2):73-96.
3. Heijl A, Leske MC, Bengtsson B, et al; Early Manifest Glaucoma Trial Group. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial. *Arch Ophthalmol*. 2002 Oct;120(10):1268-79.
4. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *UK Prospective Diabetes Study Group*. *BMJ*. 1998 Sep 12;317(7160):703-13.
5. Musch DC, Gillespie BW, Lichter PR, et al; CIGTS Study Investigators. Visual field progression in the Collaborative Initial Glaucoma Treatment Study: the impact of treatment and other baseline factors. *Ophthalmology*. 2009 Feb;116(2):200-7.
6. Levin AM, Vezina D, Wirostko BM. Home-based intraocular pressure measurements: tracing a parallel with out-of-office blood pressure measurement. *Ophthalmol Glaucoma*. 2021 May-Jun;4(3):235-7.
7. Levin A, McGlumphy EJ, Chaya CJ, et al. The utility of home tonometry for peri-interventional decision-making in glaucoma surgery: Case series. *American Journal of Ophthalmology Case Reports*. 2022; Aug 15. [Epub ahead of print].