

# **DISCUSSING IOL OPTIONS WITH PATIENTS**

## **My tested guidance for clear, effective communication**

By ARTHUR CUMMINGS, MD, FRCSED February 1, 2022

0

---

Informed consent for patients receiving IOLs has never been more important — patients need to know their options as well as the risks and benefits. Only after receiving this information can they make a decision on the IOL best for their needs.

So, how does this conversation with patients go in my experience? Here, I discuss my methods for gathering the relevant data for each patient, as well as effective, accurate presentation of that data to the patient.

### **RESEARCH BEGINS WITH THE FIRST ENCOUNTER**

For starters, the IOL option is not mentioned for the first time at my initial visit with the patient. The idea that the patient will need to decide on an IOL has already been planted during my practice's first interaction with them.

When someone contacts the clinic, whether by phone or email or via the website, a link is sent to the patient for them to submit a medical history form. Along with the usual medical, ophthalmic and medication questions, this form specifically asks what the patient is hoping to achieve from possible surgery.

Are they looking for good distance vision knowing that they would need glasses to read up close? This would suggest a monofocal or monofocal toric IOL with emmetropia as the goal. Are they seeking greater freedom from glasses? If so, are they prepared to wear glasses for small print, suggesting that an extended depth of field (EDOF) IOL or mini-monovision (blended vision) is the best approach? Are they seeking the widest range of vision possible? This suggests a trifocal IOL or blended vision with an extended range of focus IOL.

### **HOW TO MINE FOR OBJECTIVE DATA**

To help the patient make an informed decision, we often use objective visual data obtained with Vivior Behaviour Monitor (VBM) to determine their preferred working distances, head position, the ambient light temperature and intensity and the amount of UV- and blue-light that the patient is exposed to. This data is collected over a 36-hour period using VBM.

Sometimes this is achieved by wearing the Vivior Monitor (Vivior AG) for about 12 hours each day for 3 days, but most times it is collected over 4 to 7 days, or a total of 36 hours. The device consists of sensors measuring distance, ambient light and color, an accelerometer, a gyroscope and a magnetometer; it is worn on prescription or clear glasses.

The data is collected in the patient's home and office environment and provides more insight into their visual requirements than any questionnaire or conversation may produce. The recorded data are uploaded to the cloud when the system is returned for processing and analysis. Sensor data are converted into patient behavioral data using artificial intelligence algorithms and provided to the surgeon.

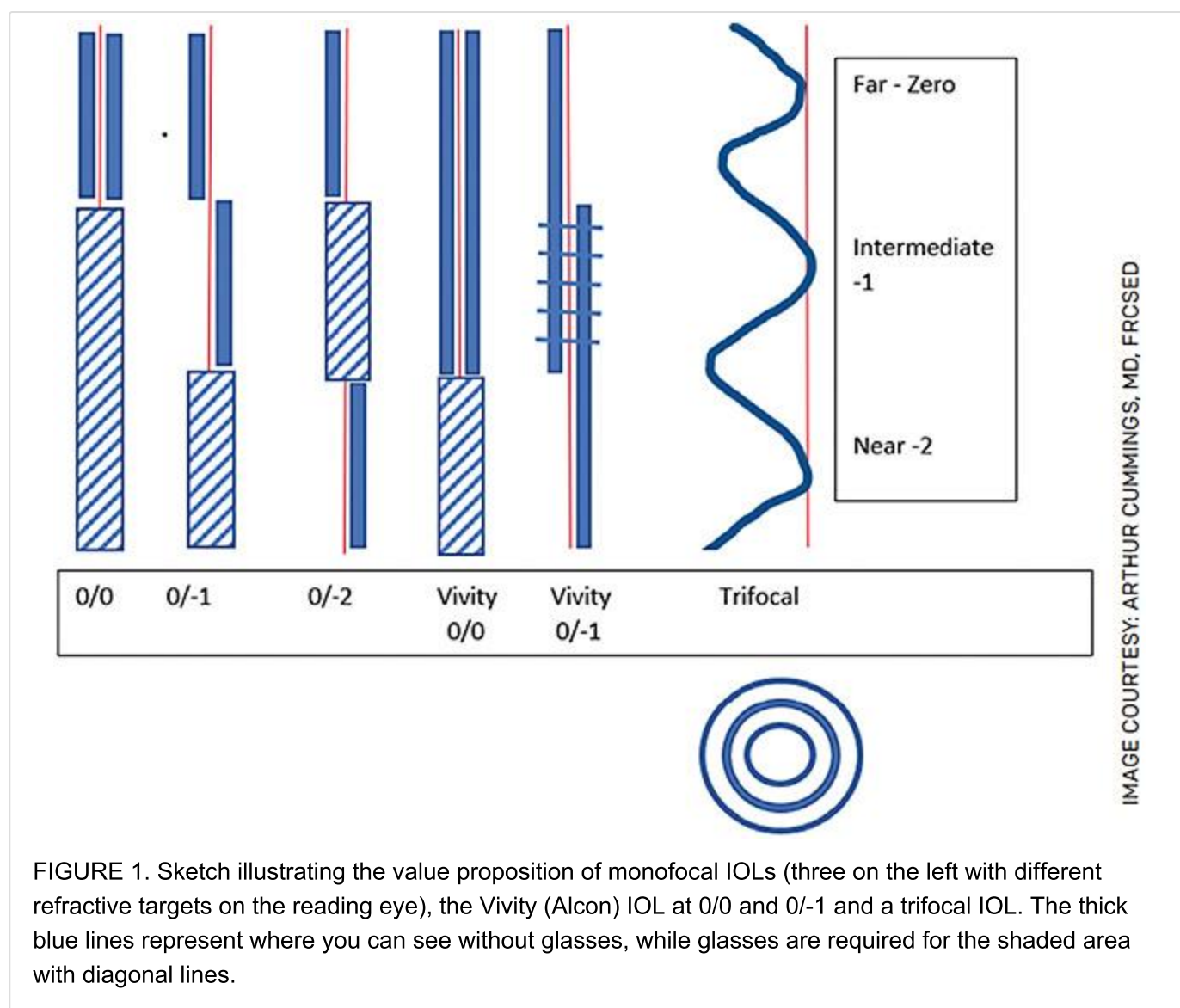
The Vivior software then compares the defocus curves of almost all the available IOLs on the market to be compared to the patient's personal defocus curve. Additionally, the software also compares this to blended vision with a range of defocus targets for the reading eye including 0/-1, 0/-1.25, 0/-1.50, 0/-1.75 and 0/-2. IOLs like the X-wavefront-shaping Vivivity (Alcon) IOL have the Vivivity defocus curve in four versions, namely both eyes and emmetropia all the way though 0/-1 in 0.25-D increments of 0/-0.50 and 0/-0.75.

Using the VBM data is the simplest way to select the most appropriate IOL match, but additional issues must be considered as well, such as cost, acceptability of blended vision on testing, aversion to any night-time quality issues such as haloes or glare at night with driving.

## PATIENT EDUCATION BY PICTURE

### Vision breakdown

**Figure 1** is a sketch that I make on every consent form even if we have already made a choice using the VBM data. It simply illustrates and documents the process that we have been through to inform the patient and arrive at the best decision for them.



I explain to patients that the thick blue lines represent where they can see without glasses. So, with 0-0, they can see far if we hit target and will need glasses for intermediate and near vision (PC and phone – shaded area).

If they choose 0/-1 with a monofocal IOL, they will see far and intermediate without glasses, but they will need glasses for near (ie, phone, reading a menu or book) shown in the shaded area with diagonal lines.

If they choose 0/-2, they will see far and near but will find there is a gap in the centre, around where a computer display would likely be. The patient may require glasses for the computer, and they may find that dealing with the anisometropia with one eye at 0 and the other at -2 is more than they can comfortably manage. If they do have issues with night glare, glasses can correct this for night driving.

Vivity can correct two distances without any dysphotopsia (glare or halos). So with both eyes at 0, distance and intermediate vision is good and the patient needs glasses up near (shaded area).

Vivity at 0/-0.50, 0/-0.75 or 0/-1 provides a significantly extended range of vision without dysphotopsia. Now, instead of a gap in the middle like with monovision 0/-2, there is now overlap (horizontal bars).

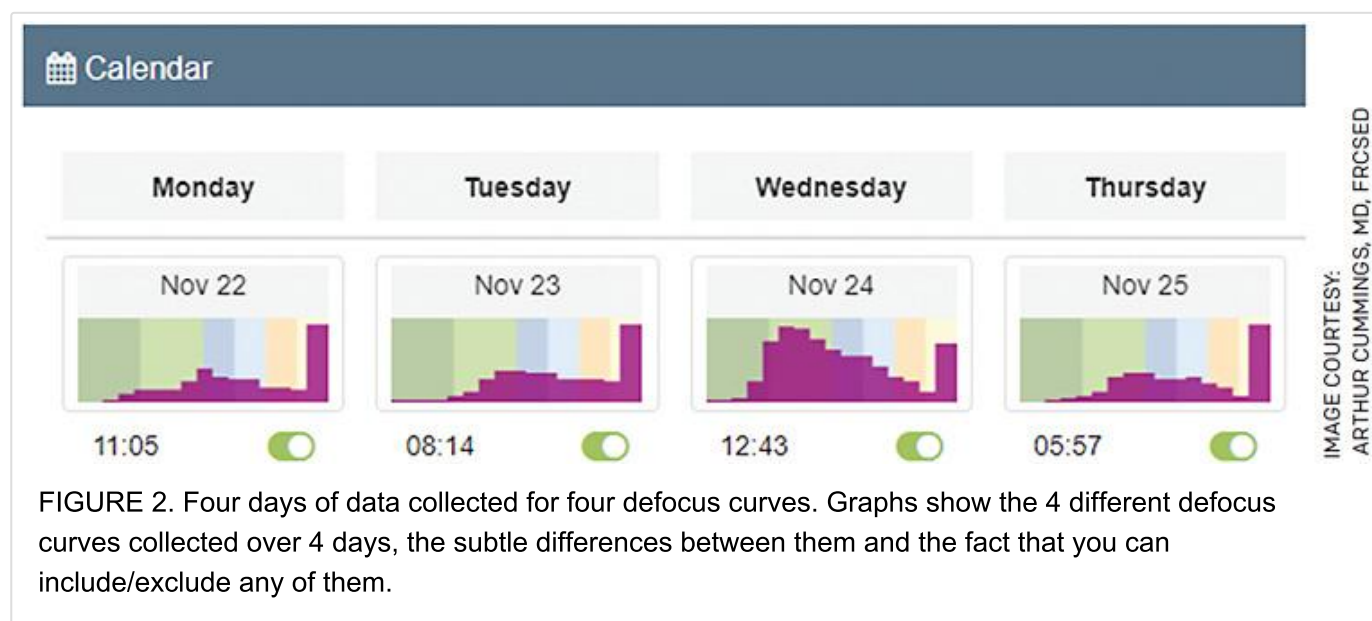
The trifocal provides the most certainty at freedom from spectacles, but this technology also results in increased dysphotopsia and potential issues with driving at night that spectacles cannot remedy.

## Trifocal vs EDOF

The next thing that I tell patients tends to help with making the decision on the trifocal vs an EDOF. I start by saying, "There is no free lunch in optics." What that means is that if we start stretching the range of vision, it will cost us in terms of the quality of vision and possibly in the sense of balance between the two eyes. If you want the most complete range of vision, it may cost you in quality-of-vision terms, especially concerning driving at night.

If you are a taxi driver who drives at night and you cannot risk not being able to drive at night, then Vivity with one eye at 0 and the other at -0.50 or -0.75 significantly increases the range while preserving good night vision. So, the more complete the range, the lower the night vision quality. The better the night vision quality, the less the range of vision.

Vivior's dashboard provides the ultimate insight into the patient's visual requirements and how an IOL may address them. The examples in **Figures 2-11** illustrate the LMI or Lifestyle Match Index.



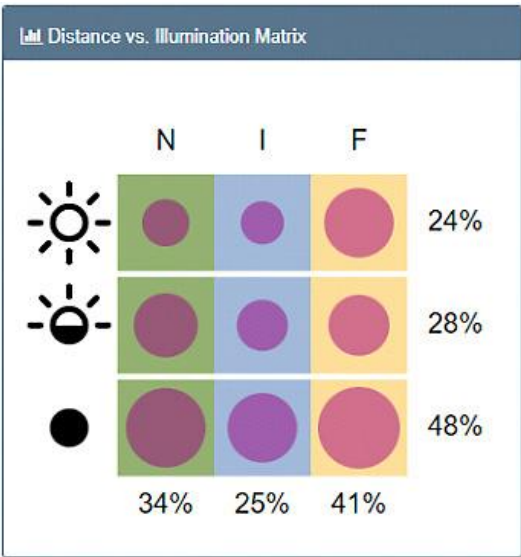
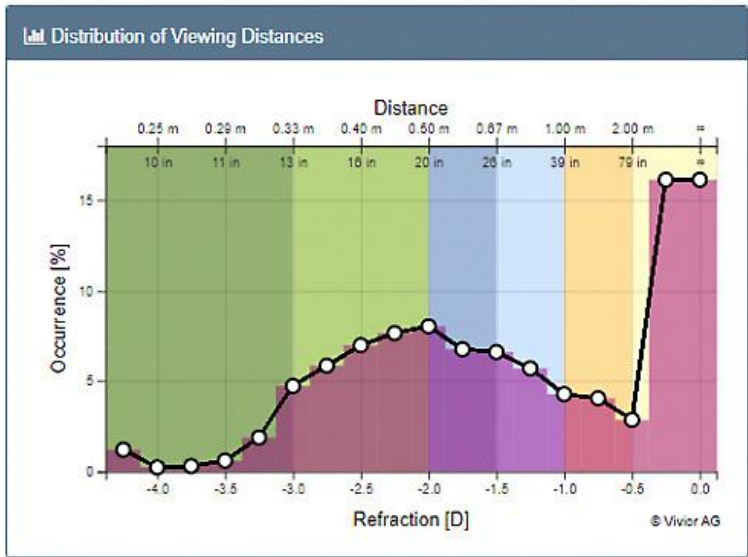


IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 3. The personal defocus curve on the left with a matrix on the right that shows 41% of the time spent at distance (F) vision and 25% at intermediate (I) and 34% at near (N). The horizontal bars demonstrate the lighting conditions with 24% in good light and 48% in more scotopic conditions.

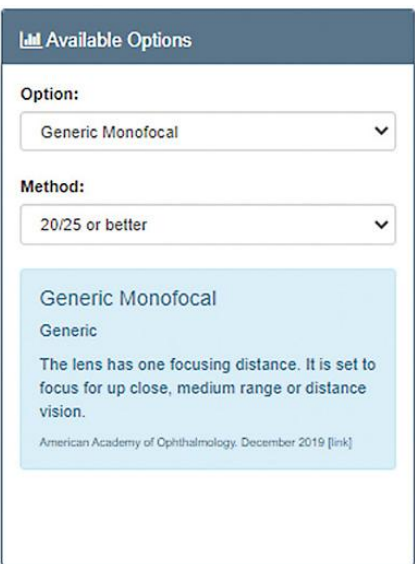
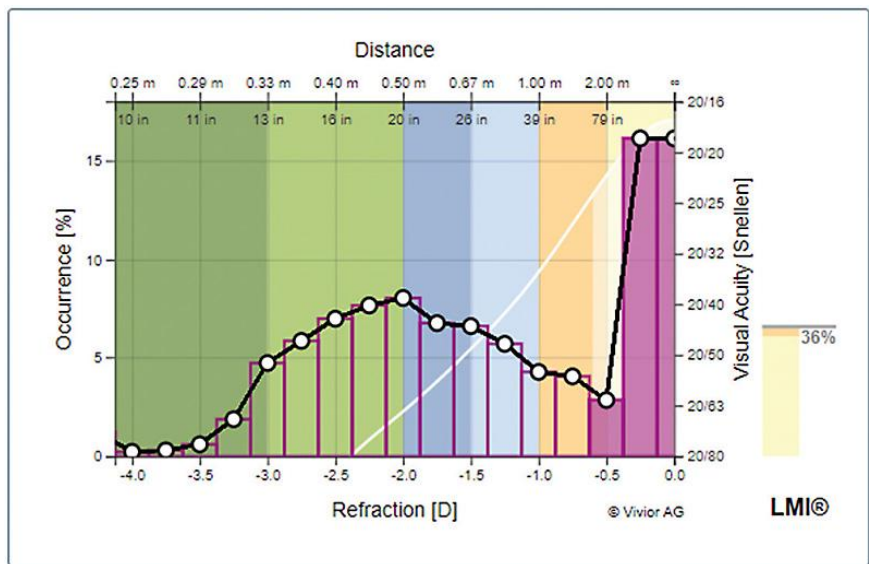
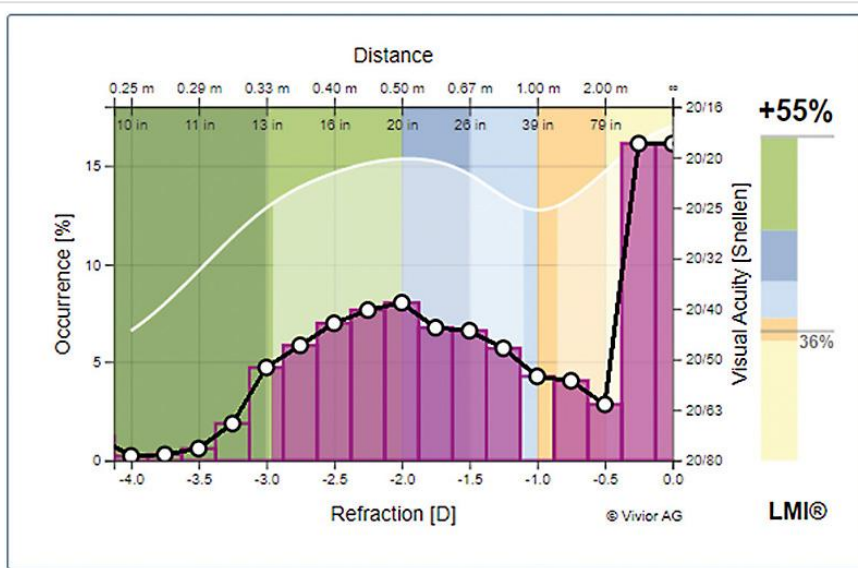


IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 4. If monofocal IOLs targeting emmetropia are selected, freedom from spectacles will be achieved for 36% of the time (shaded area) and glasses will be required for the remaining 64% (unshaded area).



**Available Options**

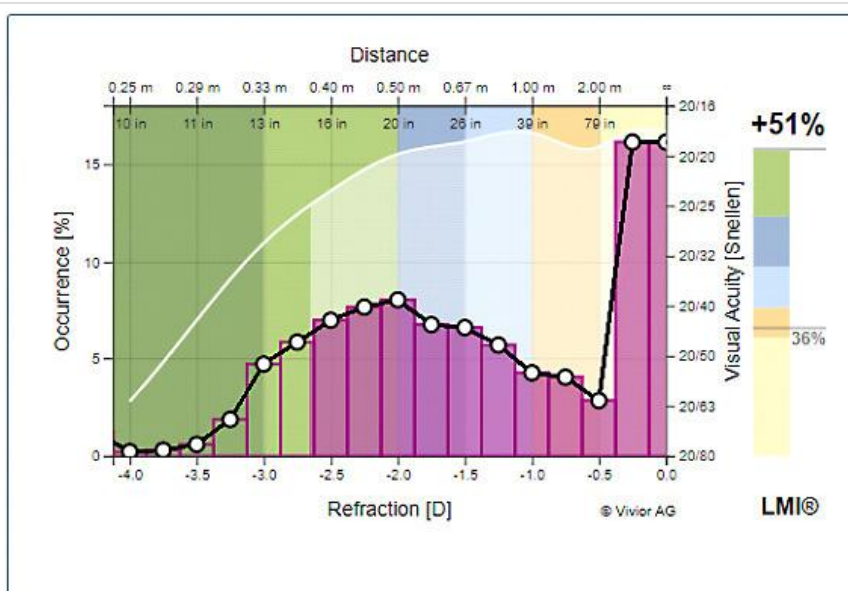
Option: AcrySof® IQ PanOptix®

Method: 20/25 or better

AcrySof® IQ PanOptix®  
Alcon Laboratories, Inc.  
Provides improved intermediate and near visual acuity and comparable distance visual acuity, compared to a monofocal IOL.  
U.S. FOOD & DRUG ADMINISTRATION. Recently Approved Devices, November 2019 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 5. The LMI software matches the PanOptix IOL (Alcon) as the best fit for the most complete range of vision, increasing the functionality without glasses from 36% to 91% with an acuity of 20/25. The vision at 1 m would not be at the 20/25 level and very likely at 20/30, so this would very likely see this patient being completely free of spectacles.



**Available Options**

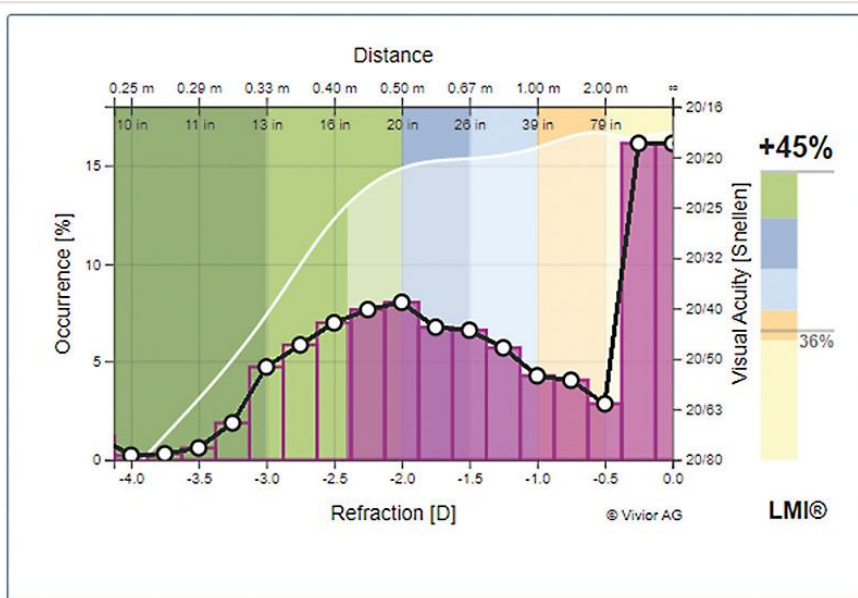
Option: AcrySof® IQ Vivity™ (non-dominant -1.00 D)

Method: 20/25 or better

AcrySof® IQ Vivity™ (non-dominant -1.00 Dpt, dominant 0 Dpt)  
Alcon Laboratories, Inc.  
An Extended Depth of Focus lens that provides continuous vision from distance to functional near. Non-dominant eye target set at -1.00 Dpt.  
Clinical Outcomes of a Novel NonDiffractive Extended Vision IOL. Cathleen McCabe, MD. January 2020 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 6. Vivity with one eye corrected to emmetropia and the other to a -1 target, would increase functionality by 51% and the patient would require reading glasses inside 15 inches or 38 cm.



**Available Options**

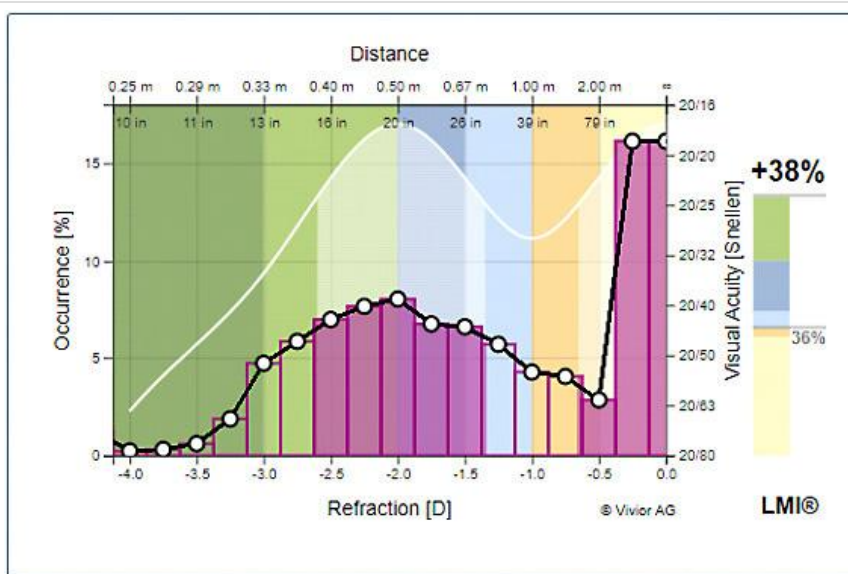
**Option:**

**Method:**

**AcrySof IQ Vivity™ (non-dominant -0.50 Dpt, dominant 0 Dpt)**  
 Alcon Laboratories, Inc.  
 An Extended Depth of Focus lens that provides continuous vision from distance to functional near. Non-dominant eye target set at -0.50 Dpt.  
Clinical Outcomes of a Novel Non-Diffractive Extended Vision IOL, Cathleen McCabe, MD, January 2020 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 7. Vivity at 0 and -0.5 D increases functionality by 45% and this offset (0.5 D of anisometropia) is generally not noticed by patients at all. This represents a significant increase in near vision with very little compromise.



**Available Options**

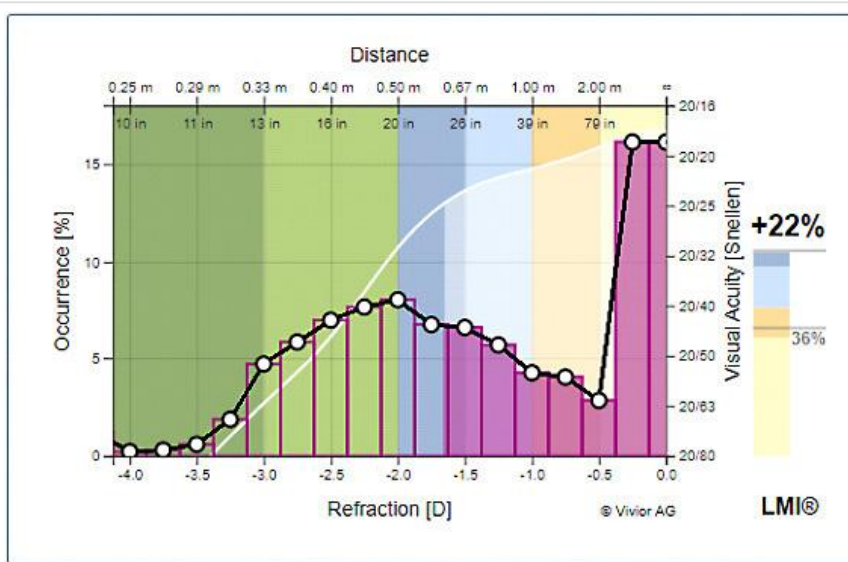
**Option:**

**Method:**

**Monovision (non-dominant -2 Dpt, dominant 0 Dpt)**  
 Generic  
 With Monovision the dominant eye is adjusted to distance vision and the non-dominant eye is adjusted to near/intermediate vision [-1.25 to -2.0 Dpt].  
American Academy of Ophthalmology, December 2019 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCSEd

FIGURE 8. Monovision or blended vision with 0/-2 increases functionality by 38%, but now the anisometropia is something that needs to be adjusted to and there is a gap at intermediate.



**Available Options**

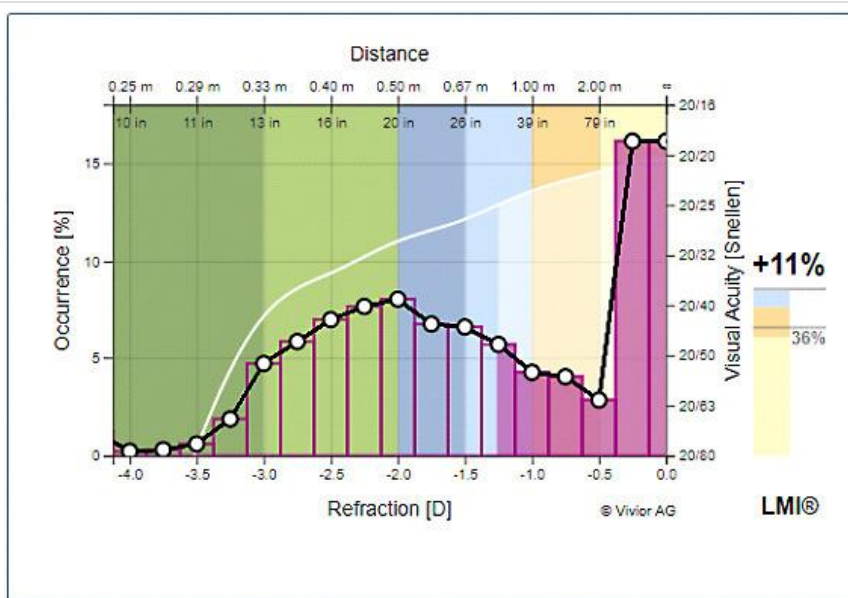
Option:

Method:

**AcrySof®IQ Vivity™**  
Alcon Laboratories, Inc.  
An Extended Depth of Focus lens that provides continuous vision from distance to functional near.  
Clinical Outcomes of a Novel NonDiffractive Extended Vision IOL. Cathleen McCabe, MD, January 2020 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCS(ED)

FIGURE 9. Vivity at 0/0 increases functionality by 22% in this specific case and glasses are still required for near.



**Available Options**

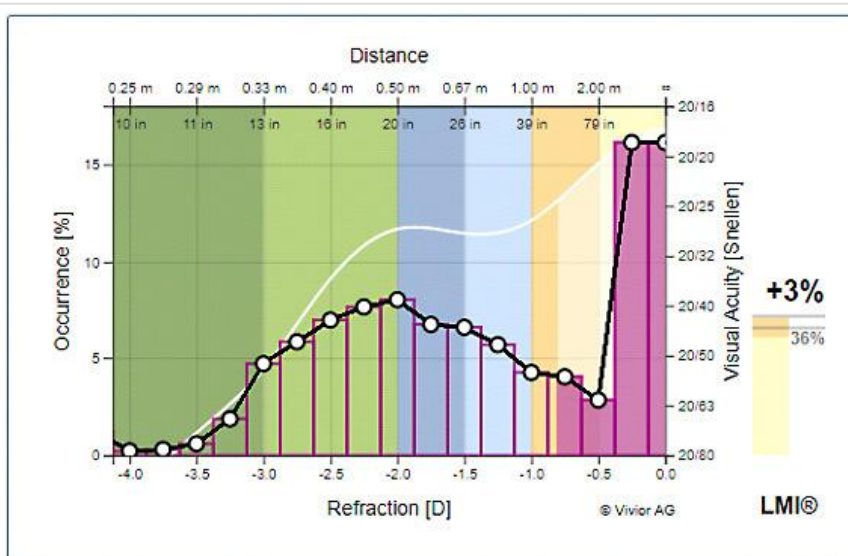
Option:

Method:

**RayOne EMV**  
Rayner IOL Ltd  
RayOne EMV provides a smoother, blended transition between the dominant and non-dominant eyes when compared to monovision achieved with standard monofocals, maintaining binocular stereoacuity and reducing asthenopia.  
RayOne EMV: First Clinical Results, Rayner, 2020 Oct. [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCS(ED)

FIGURE 10. A monofocal plus IOL like the Rayner EMV IOL (Rayner USA) increases functionality by 11% in this case. In other cases, this same IOL may add as much as 30% or even more.



**Available Options**

Option:

Method:

**AcrySof Restor® +2.5D SV2525T**  
Alcon Laboratories, Inc.  
Allows for clear distance vision, and better near and intermediate vision versus what a monofocal lens would provide.  
U.S. FOOD & DRUG ADMINISTRATION, Access data, December 2019 [link]

IMAGE COURTESY:  
ARTHUR CUMMINGS, MD, FRCS(ED)

FIGURE 11. The +2.5 D add ReStor IOL (Alcon) is included simply to illustrate why patients were sometimes dissatisfied with premium IOLs. As can be seen here, this IOL has added only 3% functionality to this particular defocus curve and yet the patient would experience the dysphotopsia from diffractive IOLs.

## DON'T FEAR THE COST FACTOR

The final hurdle we discuss is typically cost. I have learned along the way that we underestimate patients' willingness to pay. If I sense any resistance to cost, I usually revert to the analogy of hearing aids. In Ireland and most of Europe, the additional cost for advanced technology IOLs or presbyopia-correcting IOLs is less than €1000 per IOL more than a monofocal IOL. I tell patients, "This is a once-off cost and provides you with the increased functionality on a permanent basis, every waking minute. With hearing aids, the costs are closer to €4000 to €6000 per set of hearing aids, and these are typically updated every 4 to 6 years."

Patients have no problem paying this, yet we think that they may be resistant to this one-time charge. There is also a modest cost of €100 to €150 (about \$113 to \$169) for the use of Vivior, but the explanation that VBM data provides the very best method of selecting the most appropriate IOL for their visual needs is usually well accepted, once they realize that IOL surgery is typically permanent.

## A COMPREHENSIVE CONSENT

Consent for cataract or custom lens replacement has evolved into the typical consent around the risks and benefits of the surgery itself, plus an additional consent for the IOL design or refractive target offset or both. As with any consent, patients need to know their options and understand the risk/benefit and the cost/benefit ratios for each.

I have found that following the above protocol serves these purposes well. **OM**



**Arthur Cummings, MD, FRCSEd**, is medical director at Wellington Eye Clinic in Dublin, Ireland.

Disclosures: Dr. Cummings reports financial relationships with Alcon and Vivior.

*Ophthalmology Management*, Volume: 26, Issue: February 2022, page(s): 16-18, 20

[Table of Contents](#)

[Archives](#)



