# Instructions to Use: Dr Zain’s Presbyopic LASIK Ray Diagram Calculator

## Overview

This interactive calculator simulates depth of focus changes for hypermetropic presbyopic patients undergoing customized LASIK on the Wavelight EX500 platform. It visualizes how Q value modulation, binocular inherent accommodation (BIA), refraction changes, and monovision affect near and binocular vision.

## Step-by-Step Usage

1. \*\*Enter Actual Refraction\*\*: Input the baseline distance refraction of both eyes (RE and LE). These values are for reference only and do not affect the diagrams.

2. \*\*Set BIA (Binocular Inherent Accommodation)\*\*: This is calculated as 2.5 – binocular reading add. It indicates natural depth of field. A value of 1D typically means the patient can accommodate 1D naturally. The BIA zone (yellow) appears to the \*\*left\*\* of the retina.

3. \*\*Adjust Q Value Modulation\*\*: Choose the Q value change (ΔQ) for each eye. A ΔQ of 0.3 induces 1.25D of depth of focus (DOF), represented by the green bar to the \*\*right\*\* of the retina.

4. \*\*Add Refraction\*\*: This compensates for the Q-induced DOF and moves the green DOF bar \*\*leftward\*\* toward the retina. Each 0.25D refraction added shifts the bar left proportionally.

5. \*\*Apply Monovision\*\*: Select which eye will be given a monovision boost (up to 1.5D). This moves the entire convergence point and DOF bars leftward for the selected eye. Useful for achieving additional near vision.

6. \*\*Check Binocular Overlap\*\*: Enable the checkbox to visualize binocular fusion range (cyan). This is the overlapping DOF of both eyes. Ideal range: \*\*1.0 to 1.5D\*\*. If < 0.75D, a red warning appears indicating poor binocular fusion.

## Visual References

• 🔴 Retina line: fixed reference at 0D

• 📖 Near line: 2.5D to the left of retina (near point for 40 cm)

• 🟡 Yellow bar: depth of focus from BIA

• 🟢 Green bar: depth of focus from Q modulation

• 🔷 Cyan zone: binocular DOF overlap (appears if option selected)

## Important Notes

• This tool is ONLY applicable to hypermetropic or hypermetropic astigmatic patients.

• It is designed exclusively for the Wavelight EX500 platform using \*\*6mm optic zone\*\*.

• Treatment and Q modulation must be done in \*\*Custom Q mode\*\* after capturing topolyzer images.

• Max allowable Q modulation per eye = 0.36.

• DOF beyond 2.5D is unnecessary, as it corresponds to reading at 25 cm.