

# Vector Analysis Reveals That Topography-Guided LASIK Targeting the Manifest Refraction (MR) is Superior to Topography-Modified Refraction (TMR) and Layer Yolke Reduction of Astigmatism (LYRA) [Response to Letter]

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## Dear editor

We have read with great interest the letter concerning our work sent by Dr Wallerstein and Dr Gauvin.

First of all, it is an honor and a pleasure to respond to their queries and we hope to clarify a few points.

UDVA of 20/25 was achieved in 100% of the Group in which we aimed at treating the Topographic astigmatism without any change in the manifest sphere (Group III) while in the group where we treated the manifest astigmatism and sphere the number of patients who achieved UDVA of 20/25 was 95% (Group I), the same percentage in the group where we used topographic cylinder but kept the spherical equivalent the same by manipulating the spherical component (Group II).

As regards the anterior corneal astigmatism, the mean preoperative and postoperative values were  $2.47 \pm 0.78$  and  $0.94 \pm 0.43$  D in the manifest group ( $P$ -value $<0.001$ ), compared to  $2.97 \pm 1.09$  and  $0.59 \pm 0.28$  D in the full TMR group ( $P$ -value $<0.001$ ) and  $2.31 \pm 0.65$  and  $0.47 \pm 0.22$  D in the partial TMR group ( $P$ -value $<0.001$ ). When comparing the postoperative anterior corneal astigmatism between the three groups, the difference was statistically significant ( $P$ -value=0.001) As regards the anterior corneal astigmatism, the mean preoperative and postoperative values were  $2.47 \pm 0.78$  and  $0.94 \pm 0.43$  D in the manifest group ( $P$ -value $<0.001$ ), compared to  $2.97 \pm 1.09$  and  $0.59 \pm 0.28$  D in the full TMR group ( $P$ -value $<0.001$ ) and  $2.31 \pm 0.65$  and  $0.47 \pm 0.22$  D in the partial TMR group ( $P$ -value $<0.001$ ). When comparing the postoperative anterior corneal astigmatism between the three groups, the difference was statistically significant ( $P$ -value=0.001).

We do understand the concern about the DV difference. Although it was better for the manifest group, the difference was not statistically significant. The Correction index was mostly the same (1) in the three groups. Since the DV was in favor of the manifest group but the difference was not statistically significant, we searched for a methodical statistically significant difference between the three

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groups to report and the resultant anterior corneal astigmatism stood out in favor of the group of treating the topographic astigmatism, as well as the UDVA so the logic winner was Group III.

It is fair to say though that the results of all groups were close and that topography-guided ablation on this platform yields excellent results. The question is whether the HOAs in patients with astigmatism do affect the resultant value and axis of the primary lower-order cylinder or not giving a manifest “Astigmatic equivalent”.

If a standard aspheric ablation is used, it only makes sense to treat the manifest refraction, but when a detailed topography-guided ablation is used, in which smoothening of the corneal surface and eliminating

much of the minute irregularities that lead to HOAs, then the True primary lower-order cylinder is bared and should be treated rather than the manifest “Astigmatic equivalent”.

I hope this explains the deduction of our conclusions. We have enjoyed the comments, and we respect any effort in fine-tuning our ablation profiles through evidence for the sake of our patients.

All The best to Dr Avi Wallerstein and Dr Mathieu Gauvin.

## Disclosure

The authors report no conflicts of interest in this communication.

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