

Estimating Corneal Elevation Differences Using Corneal Astigmatism

- **Studies have found a relationship between corneal elevation differences and corneal astigmatism. If no elevation map is available, measure the patient's corneal astigmatism and use that value to estimate the lens toricity using the table below (Table 1.)**
- **Corneal astigmatism can be determined by subtracting the patient's flat K reading from their steep K reading.**

In [Calculating Average Corneal Elevation Differences Using Topography](#), we discussed how to determine if a toric lens would provide the best lens centration by calculating the average corneal elevation differences using topography. In this article, we will discuss what to do if elevation maps are not available. In some situations, customers may not have topography readily available, or their topography may not have an elevation map. In these cases, you can also estimate the patient's average corneal elevation differences by reviewing their corneal astigmatism. **Corneal astigmatism can be determined by subtracting the patient's flat K reading from their steep K reading.** Example:

Patient A has a flat K of 43.00 and a steep K of 44.00. $44.00 - 43.00 = 1.00$, so the patient has 1.00D of corneal astigmatism.

Studies (links below) have found a relationship between corneal elevation differences and corneal astigmatism. If no elevation map is available, measure the patient's corneal astigmatism and use that value to estimate the lens toricity using the table below (Table 1.)

Table 1. Corneal astigmatism's relationship to elevation difference and recommended lens toricity.

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Corneal astigmatism (D)	Elevation difference between primary meridians (SHD at 8 mm chord)	Recommendations for Lens Toricity (D)
1	24.817	0.75
1.25	30.67125	1.00
1.5	36.5255	1.00
1.75	42.37975	1.25
2	48.234	1.25
2.25	54.08825	1.50
2.5	59.9425	1.75
2.75	65.79675	1.75
3	71.651	2.00
3.25	77.50525	2.00

3.5

83.3595

2.25

[Batres et al_2020_Correlation Between Anterior Corneal Elevation Differences in Main Meridians.pdf](#)

[Tomiyaama et al_2021_Corneal Elevation, Power, and Astigmatism to Assess Toric Orthokeratology.pdf](#)