

## 3 & 9 O'clock Staining: Causes and Remedies

There are multiple causes for 3 & 9 o'clock corneal limbal staining. A base curve fit too steep or flat, mid peripheral bearing from an optical zone diameter which is too large, lateral or vertical decentration, and blink pattern are just some of the more typical causes.

One of the first things to look at in resolving 3 & 9 staining is the base curve design relationship to the K's. An extremely flat or steep fit can cause peripheral tear flow and SPK problems. If the base curve design is within reason then look at the lens position and movement during and after the blink. Gross decentration during and after the blink can be an issue even if the patient is asymptomatic to comfort and vision.

If the design and centration look on track and 3 & 9 staining is present, consider following this general rule used by our consultation team: If the lens diameter is on the small side (8.0 to 9.2), go larger by .3 to .5mm. If the lens size is large (9.3 to 10.0), reduce the diameter by .3 to .5 mm.

Also, keep in mind that the optical zone diameter plays a large role in controlling 3 & 9 staining. If you are increasing the diameter by .3 to .5 mm, it is best to keep the optical zone diameter the same as it was to prevent mid-peripheral bearing. If you decrease the diameter by .3 to .5 mm, then decrease the optical zone diameter by the same amount to make sure there is adequate peripheral clearance.

General dry eye issues can also cause 3 & 9 staining. In this case you can now consider plasma treatment. Plasma can be a great benefit in the reduction of 3 & 9 staining and should be considered when ever it is present.