NCC ‘GET CONNECTED 2026’
Organization Section: NCC/ BCLA
Paper Abstracts
Monday 9 March 2026, Netherlands, Veldhoven, NH De Koningshof, Baroniezaal

Comparison of different measurement techniques for determining the stabilization of soft toric contact lenses

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Purpose: This study evaluated three measurement methods used in optometric practice to assess the stabilization of soft toric contact lenses. The aim was to analyse the repeatability of each method and the interchangeability among them.
Method: Thirty-five participants (mean age 24.51 ± 3.4; 19 female, 16 male) were fitted with a daily disposable soft toric contact lens on the right eye. Lens stabilization was assessed using three techniques: (1) a mechanically rotatable slit of the slit lamp’s illumination unit (illumination angle 0°), (2) a measuring eyepiece at the slit-lamp, and (3) image processing software integrated with the slit-lamp microscope. Each participant underwent three measurement runs per technique.
Results: Statistical analyses using paired t-tests and ANOVA revealed no significant differences among the measurement runs (p-values 0.543–0.964; ANOVA p = 0.939). Repeatability across methods ranged from 91% to 95%, with the image processing method showing the highest consistency. Bland–Altman analysis indicated that two of the three method comparisons met the criteria for interchangeability, while limit values from practical experience suggested true interchangeability in only one case.
Conclusions: Overall, the measurement methods demonstrated a high degree of repeatability and were largely interchangeable. For clinical consistency, it is recommended to use the same method within practice. The selection of a technique should consider its specific advantages and limitations. Further research is warranted to optimize measurement standardization in this area.

This research received funding from: *None*

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