

# Influence of retinal shadows produced by myopia control spectacle lenses on retinal sensitivity – Preliminary results

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**Purpose:** To investigate the influence of shadows produced by the treatment zone of myopia control spectacle lenses on retinal sensitivity.

**Methods:** Retinal sensitivity was obtained in 5 healthy subjects using microperimetry with spectacle lenses mounted to a microperimetry device. Four myopia control spectacle lenses (MyoCare by Zeiss, Stellest by Essilor, MiYOSMART by Hoya and DOT by SightGlass Vision) and one single vision lens, serving as control were examined.

**Results:** The size of the central clear zone on retina was 10mm<sup>2</sup> (MyoCare), 17mm<sup>2</sup> (Stellest), 15 mm<sup>2</sup> (MiYOSMART) and 5mm<sup>2</sup> (DOT). For both the central and peripheral zones retinal sensitivity with the control lens was 29.0 dB.

1. For the central clear zone, no significant differences in retinal sensitivity were found between the lenses ( $p > 0.05$ ).
2. For peripheral zone retinal sensitivity with the DOT lens was significantly lower than with any other lens (28.1 dB,  $p < 0.001$ ).
3. Within the MyoCare, Stellest and MiYOSMART lenses, no difference in retinal sensitivity were noted at the retinal loci with or without a shadow cast ( $p > 0.05$ ).
4. For retinal loci with a shadow cast, there was no difference in retinal sensitivity between the MyoCare, Stellest and MiYOSMART lenses ( $p > 0.05$ ).

**Conclusions:** The Stellest lens offers greatest, while the DOT lens provides narrowest central clear zone. Shadows created by multi-segment lenses MyoCare, Stellest and MiYOSMART do not affect retinal sensitivity. The DOT lens decreased peripheral retinal sensitivity in line with its proposed working mechanism of contrast reduction.

This reduced sensitivity together with narrow central clear zone could possibly affect visual functions under unfavorable conditions (e.g. mesopic, low contrast) and raises concerns about the development of amblyopia. This lens may not be used until the risk of developing amblyopia has been eliminated. Both aspects need further investigation.