

**Title:** Low vision patients with AMD and POAG may require different lighting to maximize visual acuity

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**Purpose:** To determine patient preferences for luminance and color temperature and determine effects of these preferences on high and low-contrast visual acuity in AMD and POAG patients.

**Methods:** 30 consecutive patients with AMD (19) or POAG (11) were recruited during their regularly scheduled visit to a low vision clinic. Distance visual acuity (VA) was measured at 1 meter using an ETDRS chart. A Colenbrander Mixed Contrast Card was used to measure high contrast (100%) and low contrast (10%) VA at near in M units under standard 500 lux room lighting (RL). The Mixed Contrast Card was placed under a Lighting Assessment Device (LuxIQ), a unit with adjustable sliders for luminance (0-5000 lux) and color temperature (6500-2700 K). This was referred to as optimized lighting (OL). High and low contrast near visual acuities (HCVA and LCVA) were then repeated as above.

**Results:** Luminance preference (lux) was significantly different between patients with AMD (4289+/-713) and PAOG (2345+/-922) ( $p < 0.0001$ ). No significant difference in color temperature preference was found between AMD and POAG patients. For AMD patients, OL led to a significant improvement in HCVA (OL: 1.183 M units vs. RL: 1.767 M units;  $p < 0.0001$ ) and LCVA (OL: 4.158 M vs. RL: 5.305 M units;  $p < 0.0002$ ). For POAG patients, lighting optimization led to a significant improvement in both HCVA (OL: 1.789 vs. RL: 2.871 M units;  $p = 0.0002$ ) and LCVA (OL: 5.227 vs. RL: 6.609 M units;  $p = 0.009$ ). HCVA was significantly better than LCVA in both room lighting and optimized lighting for AMD and POAG. For both AMD and POAG patients, lighting optimization led to an equal relative gain in VA for high-contrast and low-contrast reading materials. Evaluation for differences in HCVA and LCVA between diagnoses in different lighting setting was unremarkable.

**Conclusion:** Low vision patients with AMD preferred increased luminance compared to low vision patients with POAG. Allowing low vision patients to choose their preferred lighting settings for luminance and color temperature led to an equivalent improvement for AMD and POAG patients for high and low contrast visual acuity in spite of the differences in their settings. This study indicates that while lighting can indeed improve VA in low vision patients, the characteristics of optimal lighting may vary between diagnoses.