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Glaucoma Specialist Optic Disc Margin, Rim Margin and Rim Width Discordance in Glaucoma and Glaucoma Suspect Eyes.

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**Abstract (250 words)**

**Purpose:** To quantify the variability of 5 glaucoma specialists' optic disc margin (DM), rim margin (RM) and rim width (RW) estimates.

**Design:** Inter-Observer Reliability analysis.

**Methods:** Clinicians viewed stereo-photos from 214 subjects with glaucoma or ocular hypertension and digitally marked the DM and RM. For each photo, the centroid of each clinician's DM was calculated, and an averaged  $DM_{\text{centroid}}$  was determined. The axis between the  $DM_{\text{centroid}}$  and the fovea was used to establish twelve 30° sectors. Measurements from the  $DM_{\text{centroid}}$  to each clinician's DM ( $DM_{\text{radius}}$ ) and RM ( $RM_{\text{radius}}$ ) were used to generate a RW ( $DM_{\text{radius}} - RM_{\text{radius}}$ ) and cup disc ratio (CDR) ( $RM_{\text{radius}}/DM_{\text{radius}}$ ) by sector. Parameter means, standard deviations and coefficient of variations (COVs) were calculated across all clinicians for each eye. Parameter means for each clinician, and intra-class correlation coefficients (ICC), were calculated across all eyes by sector.

**Results:** Among all eyes, the median COV by sector ranged from 3-5% for  $DM_{\text{radius}}$ , 20-25% for  $RM_{\text{radius}}$ , and 26-30% for RW. Sectoral ICCs for CDR ranged from 0.566 to 0.668. Sectors suspicious for rim thinning by one clinician were frequently overlooked by others. Among 1724 sectors in which at least one clinician was suspicious for rim thinning, ( $CDR \geq 0.7$ ), all 5 clinicians' CDRs were  $\geq 0.7$  in only 499 (29%) and 2 of the 5 clinicians failed to detect rim thinning ( $CDR < 0.7$ ) in 442 (26%).

**Conclusion:** In this study, glaucoma specialist RM, DM and RW discordance was frequent and substantial even in sectors that were suspicious for rim thinning.

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