

Evidence-Based Guidelines for the Number of Peripapillary OCT Scans Needed to Detect Glaucoma Worsening

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PURPOSE: To estimate the number of OCT scans necessary to detect moderate and rapid rates of retinal nerve fiber layer (RNFL) thickness worsening at different levels of accuracy using a large sample of glaucoma and glaucoma-suspect eyes.

DESIGN: Descriptive and simulation study.

PARTICIPANTS: Twelve thousand one hundred fifty eyes from 7392 adult patients with glaucoma or glaucoma-suspect status followed up at the Wilmer Eye Institute from 2013 through 2021. All eyes had at least 5 measurements of RNFL thickness on the Cirrus OCT (Carl Zeiss Meditec) with signal strength of 6 or more.

METHODS: Rates of RNFL worsening for average RNFL thickness and for the 4 quadrants were measured using linear regression. Simulations were used to estimate the accuracy of detecting worsening-defined as the percentage of patients in whom the true rate of RNFL worsening was at or less than different criterion rates of worsening when the OCT-measured rate was also at or less than these criterion rates-for two different measurement strategies: evenly spaced (equal time intervals between measurements) and clustered (approximately half the measurements at each end point of the period) .

MAIN OUTCOME MEASURES: The 75th percentile (moderate) and 90th percentile (rapid) rates of RNFL worsening for average RNFL thickness and the accuracy of diagnosing worsening at these moderate and rapid rates.

RESULTS: The 75th and 90th percentile rates of worsening for average RNFL thickness were $-1.09 \mu\text{m}/\text{year}$ and $-2.09 \mu\text{m}/\text{year}$.

CONCLUSIONS: To diagnose RNFL worsening more accurately, the number of OCT scans must be increased compared with current clinical practice. A clustered measurement strategy reduces the number of scans required compared with evenly spacing measurements.

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