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Repeatability and inter-examiner reliability of non-corneal tonometry using Diaton

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The present study is concerned with the reproducibility and inter-examiner reliability of intraocular pressure measurement with Diaton tonometer as well as with the possibility to use the procedure while outpatient management. The non-corneal trans-palpebral Diaton tonometry is indicated for corneal diseases (ulcers, keratitis, keratoconus) and postoperative conditions of the cornea. The handy, small "Diaton" tonometer is also used in bed rest patients. Results of Diaton tonometer measurements: [Median (1st quartile - 3rd quartile)]. For the tree examiner difference was not significant ($p = 0.645$, Kendall's W-test, power > 0.8). The inter-examiner variability coefficient was 7% (4% -9%). The intra-class correlation coefficient and associated 95% confidence interval were 0.935 (0.871-0.971) ($p < 0.001$). Moreover, for separately considered GAT control group no significant differences in Diaton

tonometer measurement results were found: GAT values: 15.5 (14.0-17.0) mmHg. Diaton values - Examiner 1: 16.0 (15.0-19.0) mmHg; Examiner 2: 16.0 (14.8-19.3) mmHg; Examiner 3: 16.5 (13.0-19.0) mmHg ($p = 0.530$, Kendall's W-test, power > 0.8. Our results showed that non-corneal Diaton tonometry is a reliable method of intraocular pressure measurement, which is not depended from the biomechanical parameters of the cornea. In particular, Diaton tonometer allows determine IOP pressure values in patients who have contraindications to standard tonometry methods (eg, ulcer). For correct Diaton tonometer handling participation in a special user course is recommended. It goes without saying that examiners must familiarize themselves with the measurement procedure, a learning phase is also required for Goldmann appplanation tonometry.

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