

## COMPARISON OF A NOVEL CELL PHONE-BASED REFRACTION TECHNIQUE (NETRA-G) WITH SUBJECTIVE REFRACTION

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**Purpose:** To assess the performance of a cell phone based refracting device (NETRA-G). This study determines the accuracy of this prototype in determining refractive error in comparison to non-cycloplegic autorefractometry (AR) and subjective refraction (SR).

**Method:** NETRA-G (NET) retrofits a high-resolution mobile phone (Samsung Galaxy S) by adding a pinhole mask, a film and a lens onto the display. The device is bi-ocular with the fellow eye viewing an object at infinity. The subject aligns red and green lines with the translation on screen proportional to refractive error. 13 subjects (mean + SD age 29.79 +/- 11.32) underwent AR, SR, and NET refraction. Subjects refractive error ranged from plano to -7.5D (mean + SD refraction -3.00 +/- 2.21D). Exclusion criteria included amblyopia and any ocular pathology.

**Results:** For all 13 subjects, the average difference between NET and SR is 0.56 +/- 0.64. The refraction determined by NET is well correlated with that of SR  $r=0.98$  and the two measures were not statistically significantly different from each other ( $p>0.05$ ). Orthogonal linear regression fit presented a slope of 0.92 and a y-intercept of -0.19D. 61% of the subjects had an error smaller than 0.5D and 23% smaller than 1D. The average difference between NET and AR is 0.56 +/- 0.61 (correlated  $r=0.99$ ).

**Conclusions:** When compared to SR, NET slightly overestimated the myopic refractive errors and had a small myopic offset of 0.19D. The results shows that NET has potential to be used as an effective tool for rapidly estimating refractive errors by non-eyecare professionals. Accuracy of this novel technique is expected to increase as technology evolves.

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Consents and Disclosures

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