Circular contrast perimetry via a web application: a patient appraisal and validation study

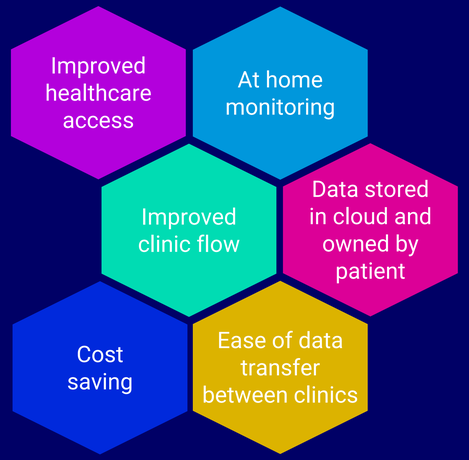
Joshua Meyerov, Linda Deng, Simon E Skalicky

THE UNIVERSITY OF MELBOURNE · Microsoft · eyeonic

Introduction

Perimetry via a web application, performed on any personal computer, offers advantages over standard perimetry

Can it be made more enjoyable?



Online Circular Contrast Perimetry

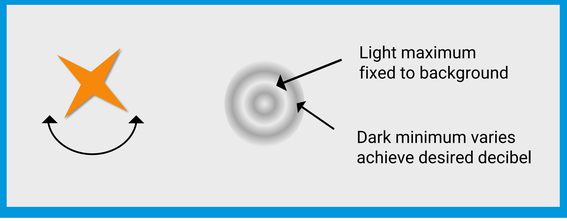
A
Fixation target
- Spinning gold star

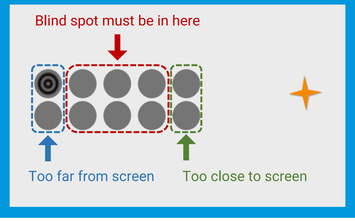
B
Flickering test target
- appears for 360 msec
- Over 3 x pos/neg cycles

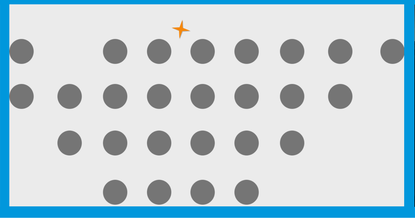
C
Blind spot localisation
- Optimise viewing distance
- Count fixation loss

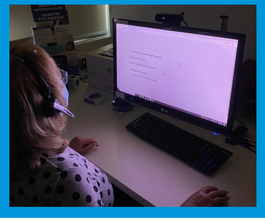
D
Moving fixation
1. Star at top; inferior hemifield tested
2. Star moves to screen bottom
3. Then superior hemifield tested

E
User monitoring
- Webcam monitors user
- AI face detection (not recognition)









Methods

Cohort
53 glaucoma, 42 controls;
Worse eye included

Tests
Standard automated perimetry (SAP), online circular contrast perimetry (OCCP), OCT RNFL and GCC

Questionnaires
2x 10-item surveys: user satisfaction of SAP vs OCCP

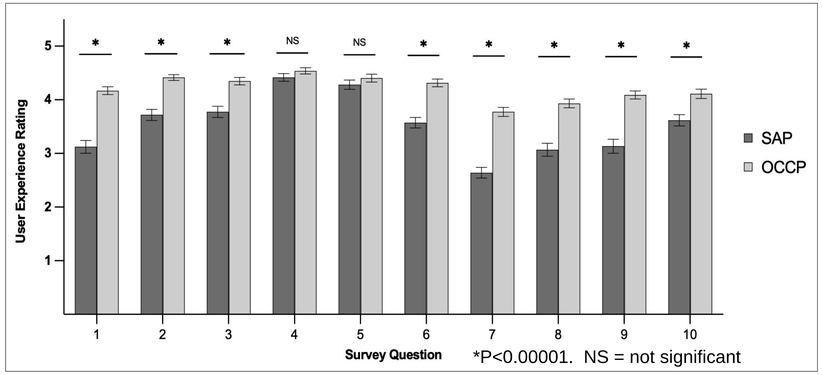
Analysis
Items Rasch analysed;
AUC and Bland-Altman plots

Results

1
User preference

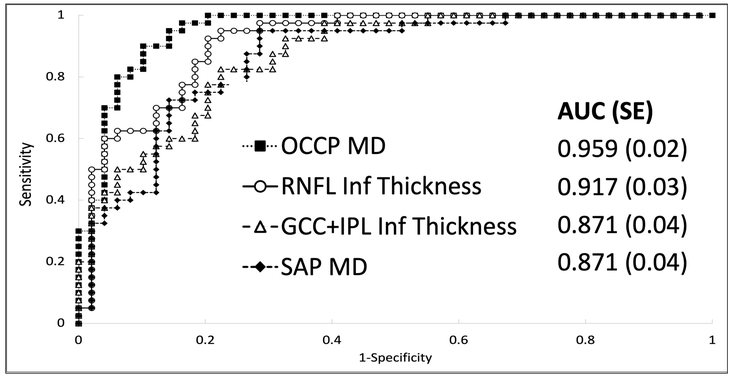
8/10 items: preference towards OCCP

82% users preferred OCCP to SAP



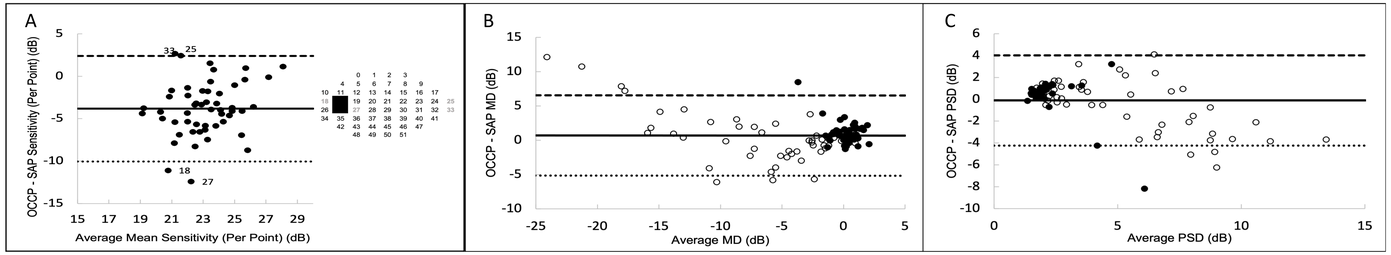
2
Glaucoma diagnostic accuracy

OCCP (MD) had AUC better than:
- SAP (MD), p = 0.03
- GCC+IPL (inf thickness), p=0.03



3
SAP & OCCP agreement

Bland-Altman plots for sensitivity per point (A), MD (B), PSD (C)



Conclusion

Users prefer OCCP to SAP

OCCP has similar diagnostic metrics to SAP

OCCP is a convenient alternative perimetry