

Evaluation of an AI system for the automated detection of glaucoma from stereoscopic optic disc photographs: the European Optic Disc Assessment Study

- Objectives To evaluate the performance of a deep learning based Artificial Intelligence (AI) software for detection of glaucoma from stereoscopic optic disc photographs, and to compare this performance to the performance of a large cohort of ophthalmologists and optometrists.
- Results
  - VESUITS Pegasus was able to detect glaucomatous optic neuropathy with an accuracy of 83.4% (95% CI: 77.5–89.2) This is comparable to an average ophthalmologist / optometrist accuracy of 80.5% / 80% respectively (95% CI: 67.2–93.8) / (95% CI: 67–88) on the same images.

  - There was no statistically significant difference between the performance of the deep learning system and ophthalmologists or optometrists.

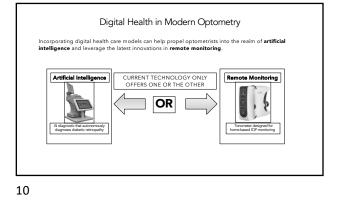
rrs, TW, Jaccard, N., Carbonara, F. et al. Eye 2019. DOI:10.1038/s41433-0190951903

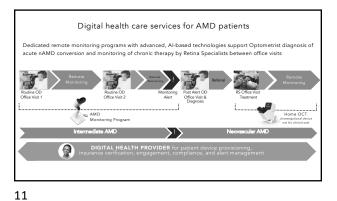


AI and OSD ..... 8

Mild/Moderate Proliferative Proliferative DR







Home OCT for monitoring chronic therapy of neovascular AMD between office visits Home Device Home OCT Image . • . • .

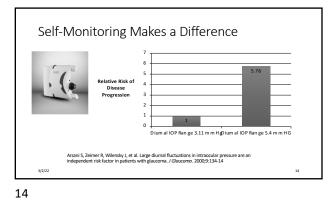


#### Icare Home

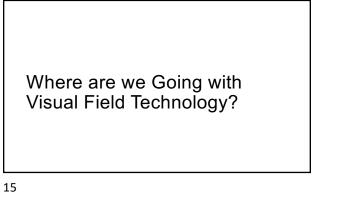
A device is intended as an adjunct for monitoring IOP of adult patients (self-use). The HOME tonometer is designed for use at home or on the go.

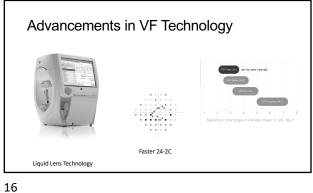


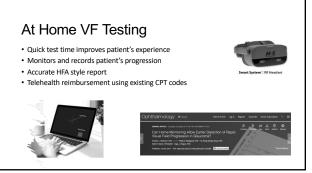


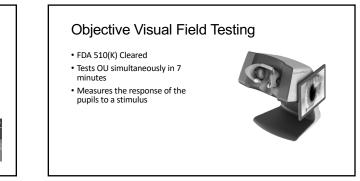


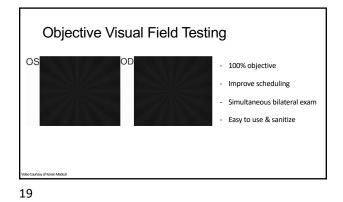
13

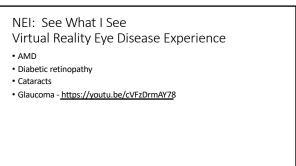


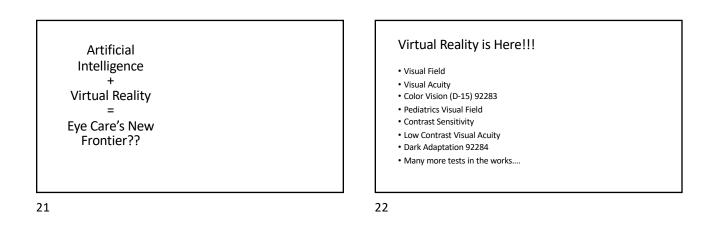


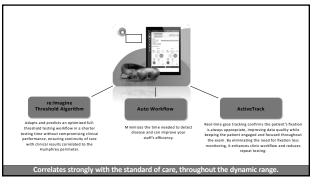


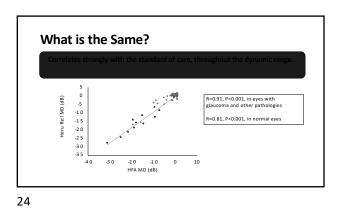




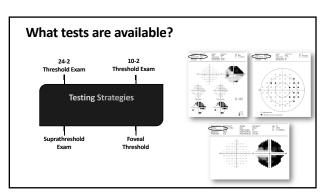


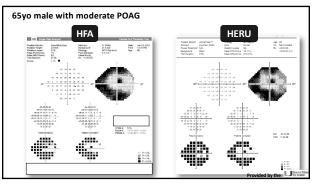


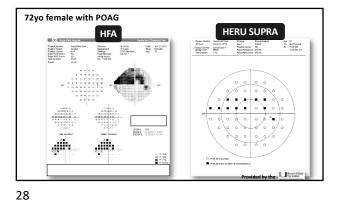


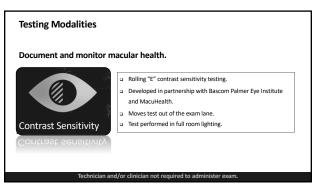


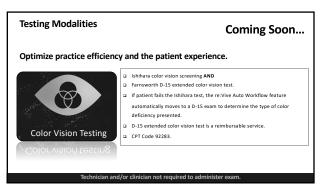


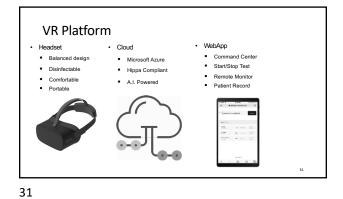






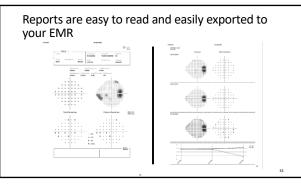






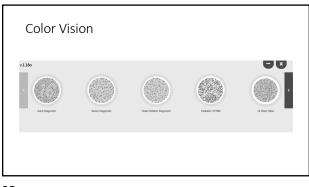


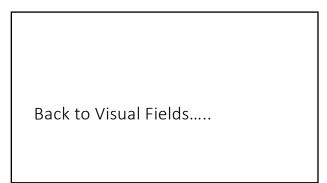
- . Supra T (Screener) 10-2/24-2/30-2 (1.5min/Eye) (92082) Pediatric Normal T - 10-2/24-2 (4-5min/eye) (92083)
- SupraFast (45 sec/eye Screener) (92082)
- Esterman Testing

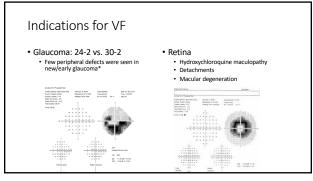


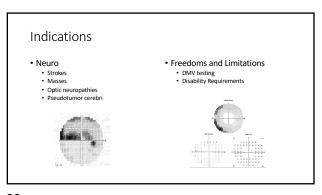




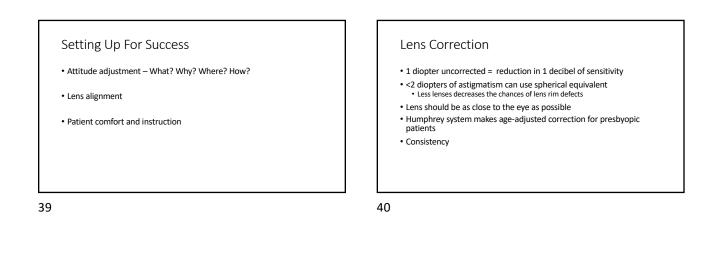


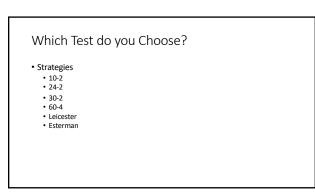


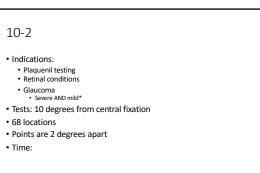










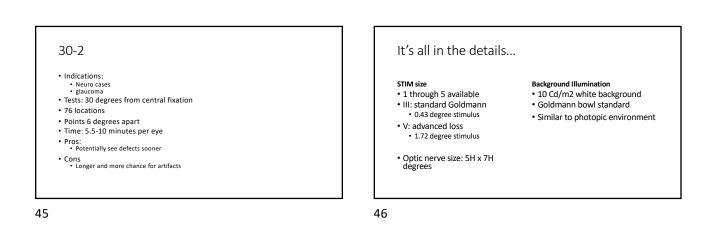


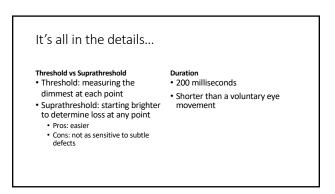
# 24-2 SITA: Swedish Interactive Thresholding Algorithm

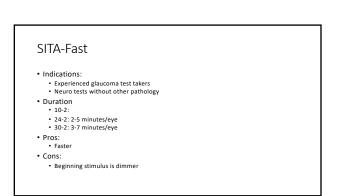
- Indications: glaucoma
- Tests: 24 degrees from central fixation
- 54 locations
- Points 6 degrees apart
- Time: 3-7 minutes per eye
- Very similar to 30-2
- Excludes superior, inferior, and temporal edge points
  Keeps nasal

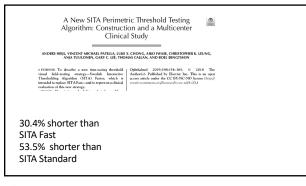
43

SITA Standard

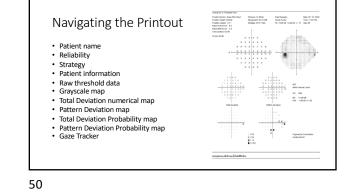






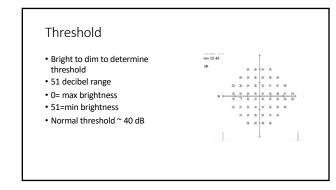




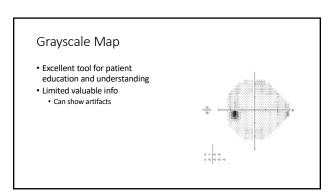


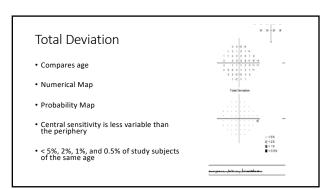
Contrasting the second second



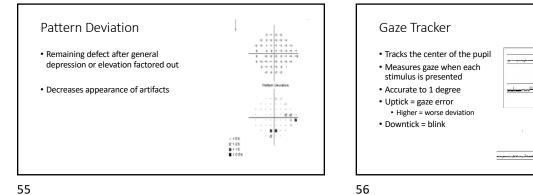


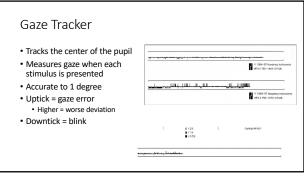


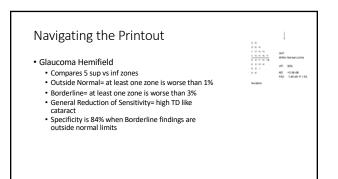


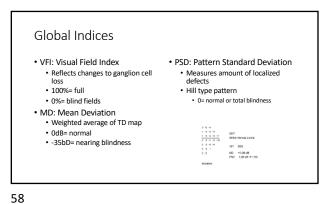


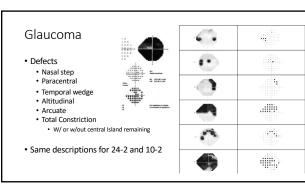


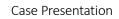












- CC: vision cloudy OS>OD
- HPI: 68 yo WM presents for cataract evaluation with h/o controlled moderate OAG OS>OD
- Current meds: Levobunolol QD OU, Travataprost qhs OU, Optive
- POHx: SLT OU 2007
- FamHx: mother with glaucoma



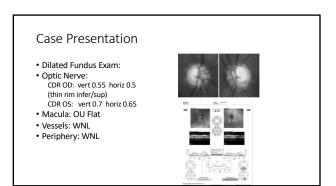
- BCVA : 20/40 OD, 20/50 OS
- Present Rx: OD -0.50+1.00 x 075
- Keratometry: OD 43.67/44.00 x 055

OS -1.00 +0.75 x 110

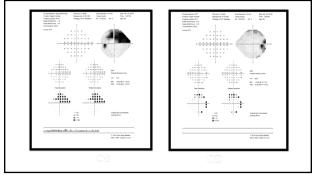
OS 43.25/44.37 x 85

- IOP: OD 14, OS 14 (GAT)
- CCT: OD 527, OS 512
- CH: 9.4/9.6
- CH: 9.4/9.6
- Tmax: OD 20; OS 24
- Gonioscopy: OU open to scleral spur • SLE 2+ NS OU
- SLE 2+ NS OU

61



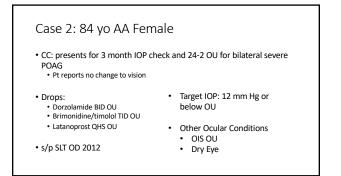
62

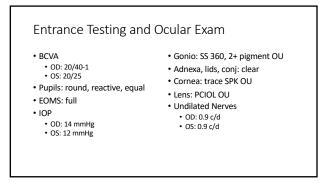


63

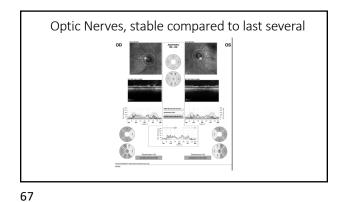


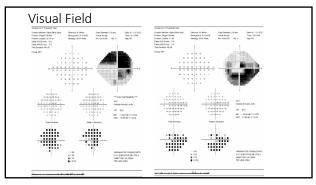
- Diagnosis: VS Cataract OU, Controlled Glaucoma
- Type of Glaucoma: open angle glaucoma • Stage of Glaucoma: Severe OS>Moderate OD • What is the Tmax? 20/24
  - What is the target pressure? Low teens OU
  - Is current treatment adequate? Yes

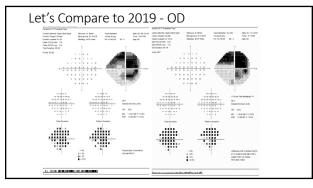


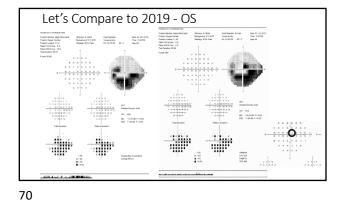


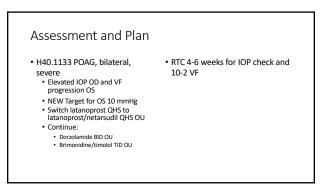


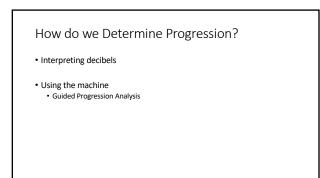




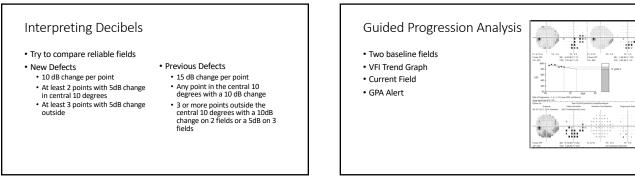




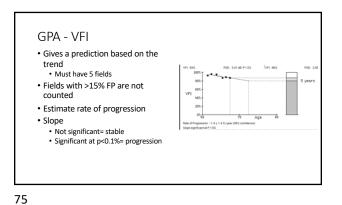




2 C . . .

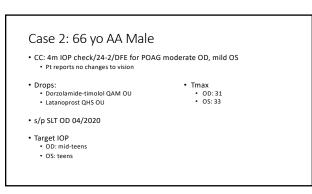


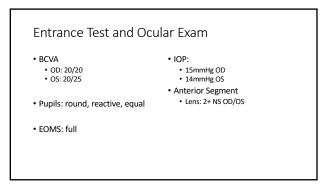
74



See Full O GPA - Alert Triangles Ц · Darken as defects are repeated Numbers indicate statistical significance :: < 5% 12 < 2% \$\$ < 1% ■ < 0.5% ↓ P < 5% De • Alert • No Progression detected Possible Progression Likely Progression

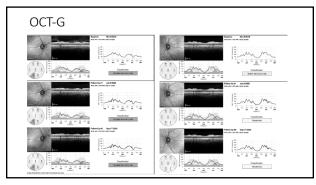




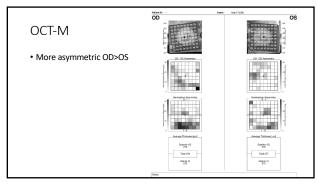


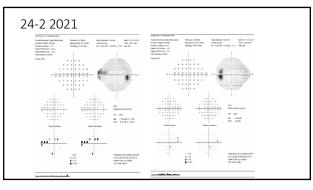


73

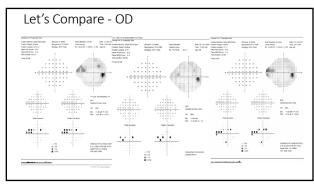




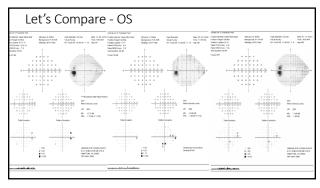


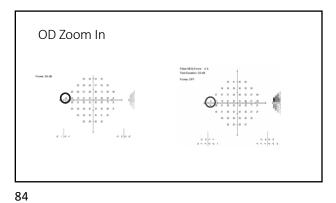


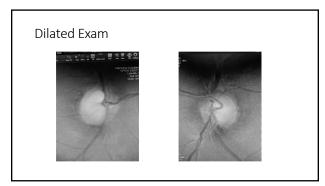




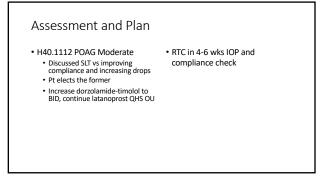


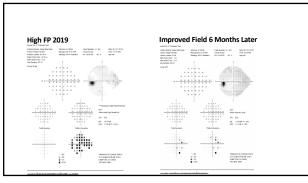




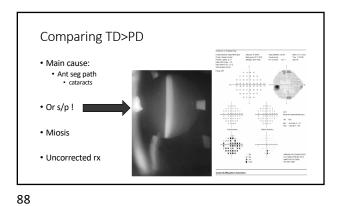


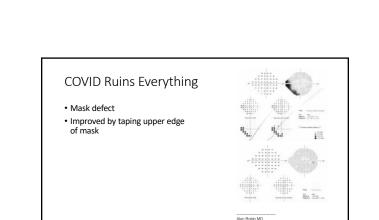


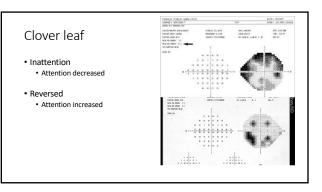




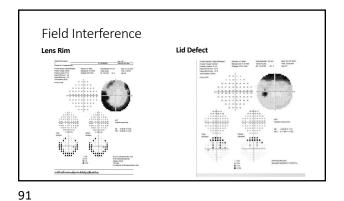




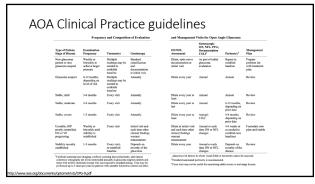


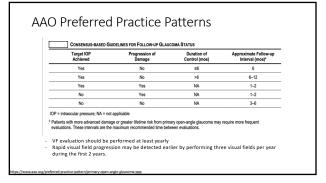




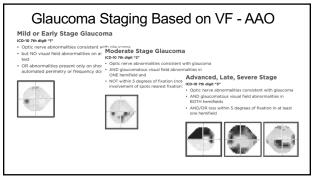


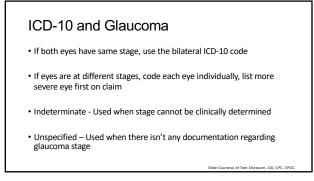
Visual Field Coding and Billing Considerations











# Important Considerations for Test

- 1) Medically Necessary?
- 2) Is the test reasonable frequency of testing?
- 3) Is the test appropriate is it going to provide the best information for the patient's problem (OCT vs. Photos)?

97

#### Testing and I&Rs

- Sequence
- Sequence
  1. Dr. sees pt and determines need for further diagnostic testing
  2. Dr. determines the most appropriate test(s) for problem
  3. Dr. enters order in pt record for same day or future date testing. Order documents medical necessity for testing
  4. Testing done.
- Doctor does Interpretation and Report
   Standing orders do nor override this sequence
- 1&F
- Test done, patient reliability
   Test interpretation, diagnosis
   Comparative analysis, if appropriate
- 4.
- Management, orders for future testing Dr. Signature 5.

ide Courtesy of Tom Cheezum, OD, CPC, CI

98

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### **Testing Frequency Guidelines**

Often included in NCD/LCDs and depend on staging of disease

#### Visual Fields

- 1x/yr borderline or controlled
  2x/yr for uncontrolled
  3x/yr for rapidly progressing

OCT (92133)
 1x/yr – suspect or mild
 1-2x/yr of VF or OCT - moderate

99

## Important Testing Considerations

- "If both SCODI and visual field tests are used, only one of each test would be considered medically necessary, as these tests provide duplicative information"
- "Advanced" Glaucoma "SCODI is not considered medically reasonable and necessary .... visual fields are more likely to detect small changes than SCODI"
- 2021 Medicare LCD document for SCODI



### Conclusion

- Fields are more difficult to interpret than an objective test
- Describing fields and understanding the field maps aids in management
- Remember the Landmark Studies: AGIS, CIGTS
- · Frequency based on medical necessity

Thank You!!!

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