



TB ECHO

Evaluating the Eyes During COVID-19

David Horne, MD

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Disclosure

- Neither I, nor my spouse/partner have/had financial or other relationships with ANY commercial interest organizations within the past 12 months.
- David Horne, MD



Objectives

- Recognize ophthalmologic adverse effects of TB medications to target monitoring strategies in patients
- Identify ways to remotely assess visual baseline and changes in patients taking TB medication to monitor safety
- Demonstrate use of a remote visual acuity tool to fulfill monitoring needs related to TB treatment for patients while observing social distancing



AEs associated with TB Meds

- Ophthalmic toxicity: EMB, LZD, ETA, INH, RFB
- EMB: optic neuropathy
 - Changes in visual acuity > red-green color > visual fields
 - Ave. time to visual impairment: 4.7 ± 2 mos (range 1-8)
 - May be permanent
 - Ave. time to resolution: 3.3 ± 3.9 months
- LZD, INH, ETA: optic neuropathy
- RFB – uveitits – esp in doses >300 mg/d
 - Erythematous, painful eyes; blurring vision

Ezer. 2013. Int J Tuberc Lung Dis



Evaluation

- Get baseline VA and color discrimination
- EMB/LZD: Screen monthly for visual acuity and color discrimination
- Diabetes control
- Educate patients about changes in VA, color discrimination, changes in visual fields, erythema, eye, pain
- If above visual changes occur, STOP Medications!

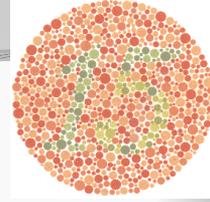


Eye Screening & Shelter in Place

- Remote eye screening options? Tips from ECHO-land?
- I did a quick review of options that are out there
- There are many apps available...most not right for our needs
- Validation is lacking

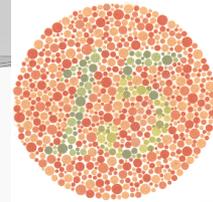


Color Discrimination Ishihara

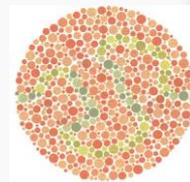
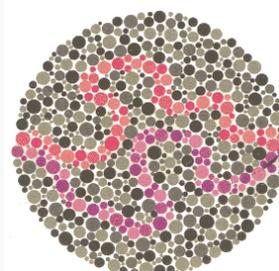
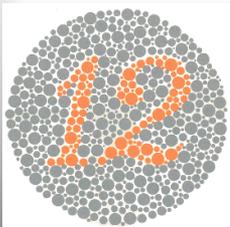


- Dr. Shinobu Ishihara developed 1917
- Many online tests and apps have deficiencies
 - Enchroma <https://enchroma.com/pages/test>
 - Colorblindness App
- Work fine if you don't have problems with color discrimination, but if you do,
 - State that you have a problem without additional info
 - Don't identify the specific plates that you got wrong
 - Crash

Color Discrimination Evaluation Options



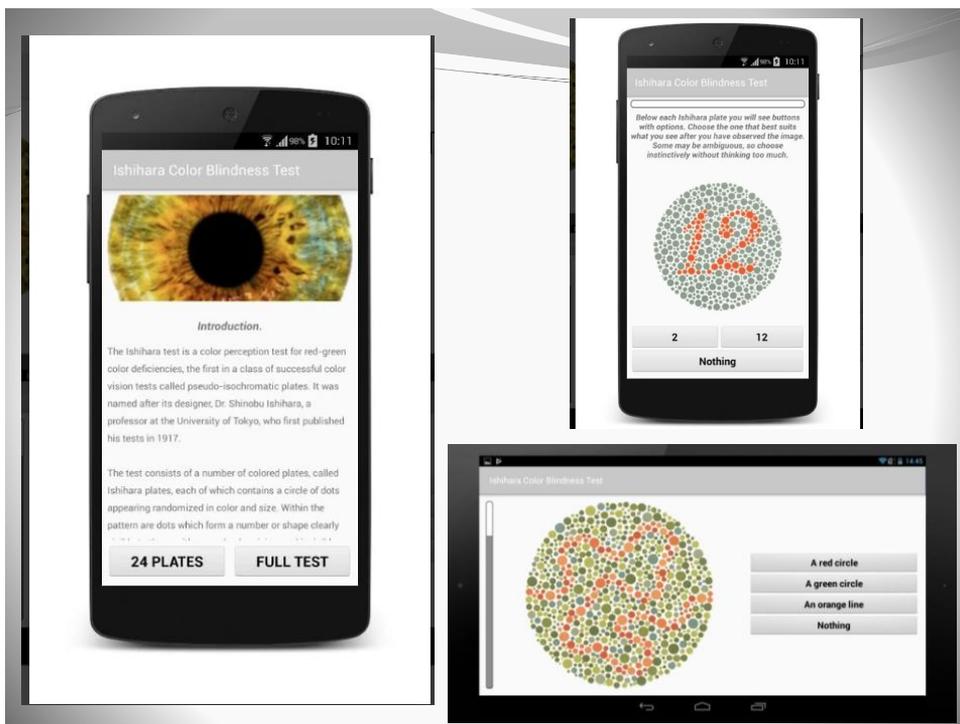
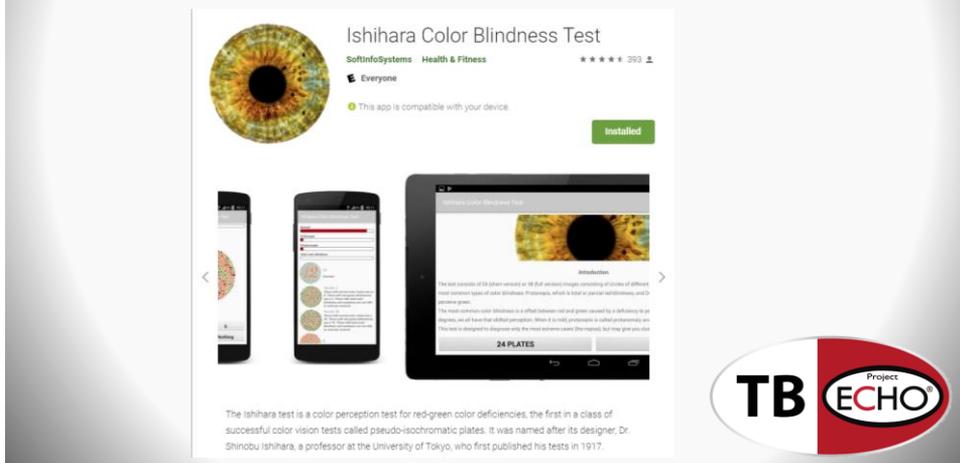
- Email the patient a pdf with the color plates and have the patient go through them with you
- One source:
https://www.challengetb.org/publications/tools/country/Ishihara_Tests.pdf

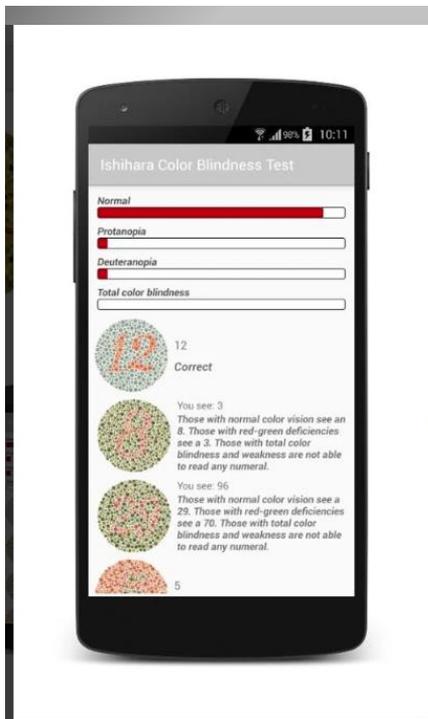


😊 Ishihara Colorblindness App

Evaluation Options

- https://play.google.com/store/apps/details?id=com.softinfosysru.ishiharacolorblindnesstest&hl=en_US





Protanopia - inability to distinguish red light

Deuteranopia – inability to distinguish green light (most common)



Visual Acuity

- Over 100 Apps available between Android and iPhone platforms
- Limitations/Issues
 - Many tell you that your eyesight is impaired and direct you to a website for eye exams
 - Adapting a visual chart to varying screen sizes does not ensure that the size, font, or required distance is accurate compared to paper chart
 - Lack of validation



Visual Acuity



- I could not find an appropriate mobile-based app that could be used without assistance
- Paper Snellen Chart?



Visual Acuity: Peek Acuity App

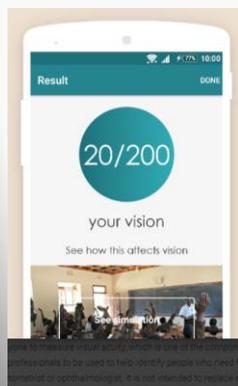
- Described in 2015 (Bastawrous *JAMA Ophthalmology*)
 - Kenya: Compared to using at patients' homes to in clinic assessment: <1 line of vision difference.
- Free!
- Scores in standard units of Snellen - including metric (6/6) and imperial (20/20) - and LogMAR (0.0)
- Requires patient + one person
- https://www.peekvision.org/en_GB/peek-solutions/peek-acuity/



Visual Acuity: Peek Acuity App

Instructional Video Available:

<https://www.youtube.com/watch?v=Xw3qMLjdpfM>



- Person holding phone stands 2 meters from patient
 - Provide with pre-cut string?



Comments or Questions?

