Vision Therapy
Experience, Hopes and Concerns as a Patient

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Disclaimers

I'm an engineer in the AR/VR and medical-device fields

These opinions my personal perspective as a patient

I'm not speaking for any of my current or previous employers

I'm not promoting any specific product or service

My condition and therapy

Double vision when tired, esp. traffic lights at night

Difficult to use stereo microscopes

Difficult two switch between focusing the board and my notes

Diagnosed at 20 years old and was told there was no treatment.

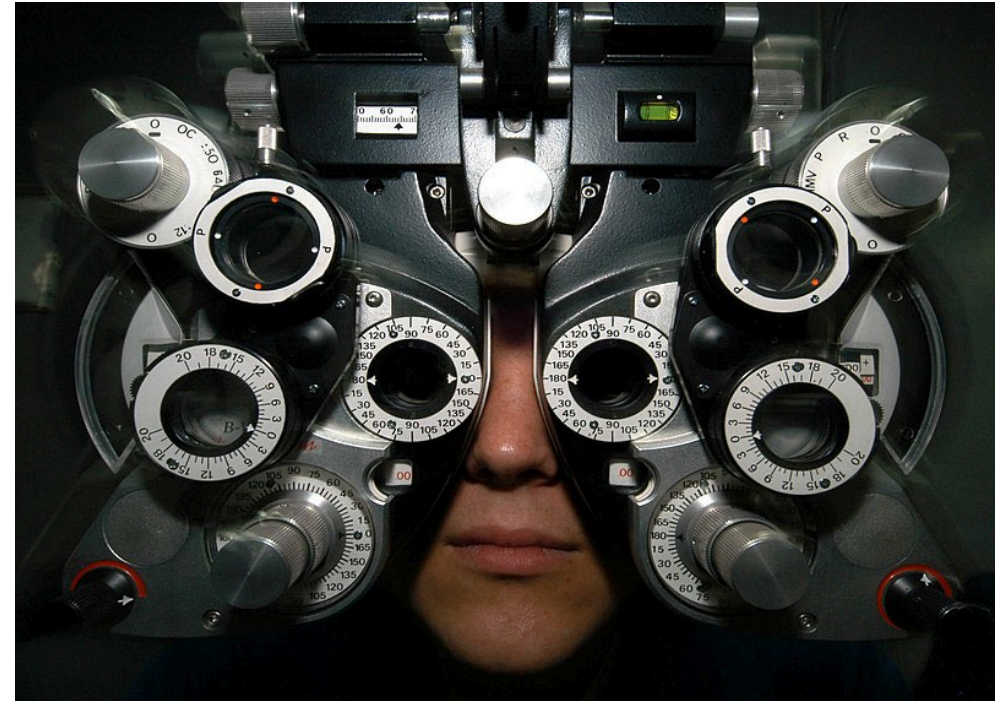20 years later, my eye doctor suggested vision therapy

Image source:
https://commons.wikimedia.org/wiki/File:Geraet_beim_Optiker.jpg

Vision therapy

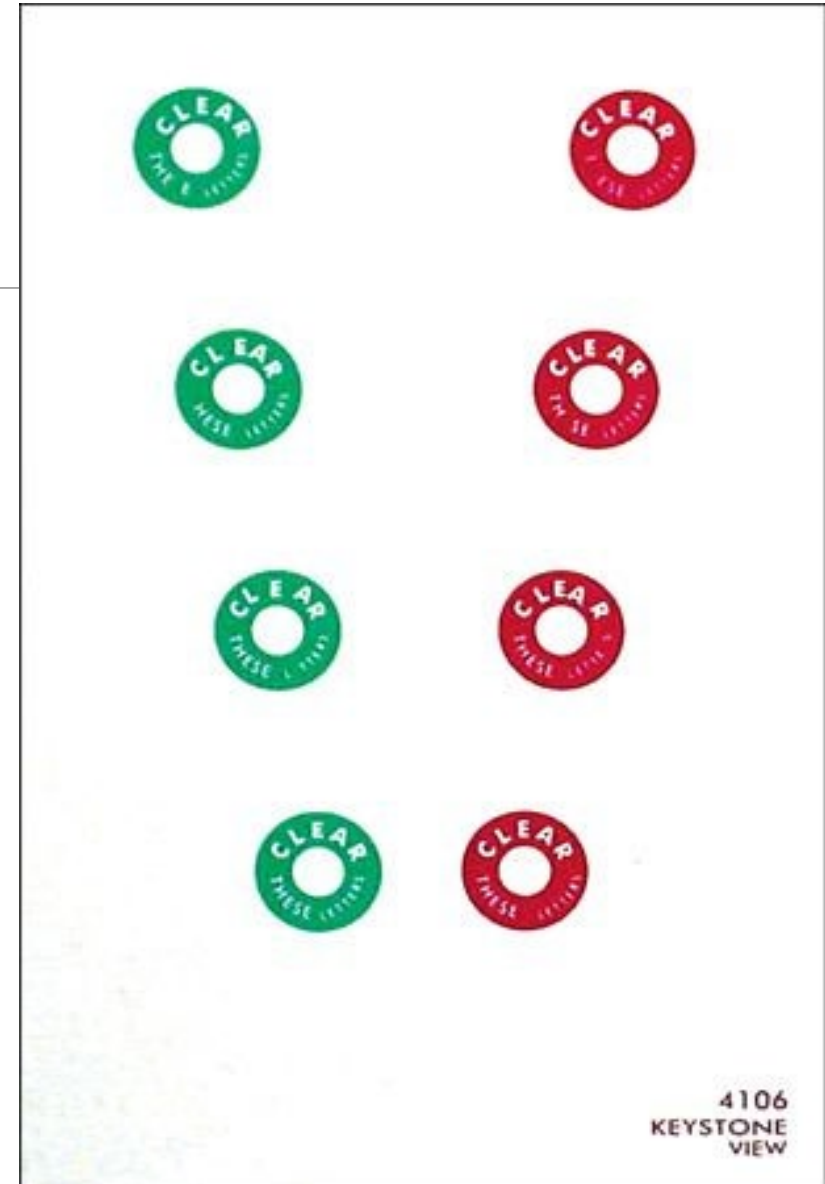Exercises with
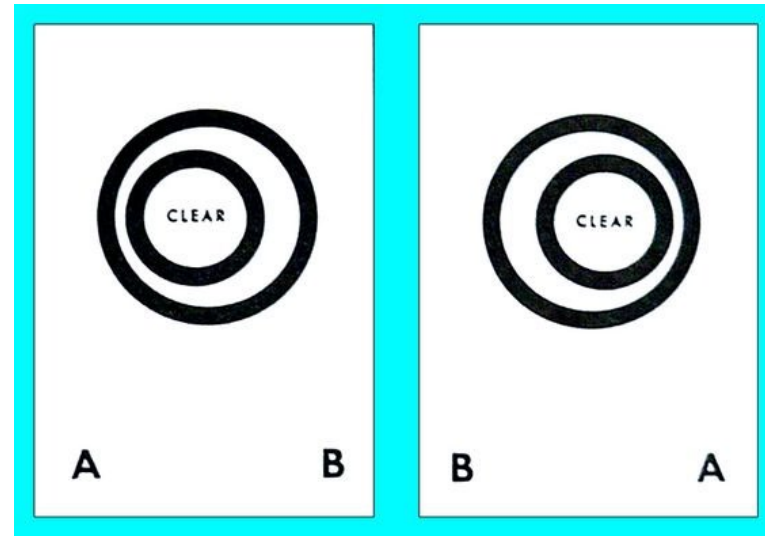
- Paper
- String
- Prisms
- Balls

Vision therapy

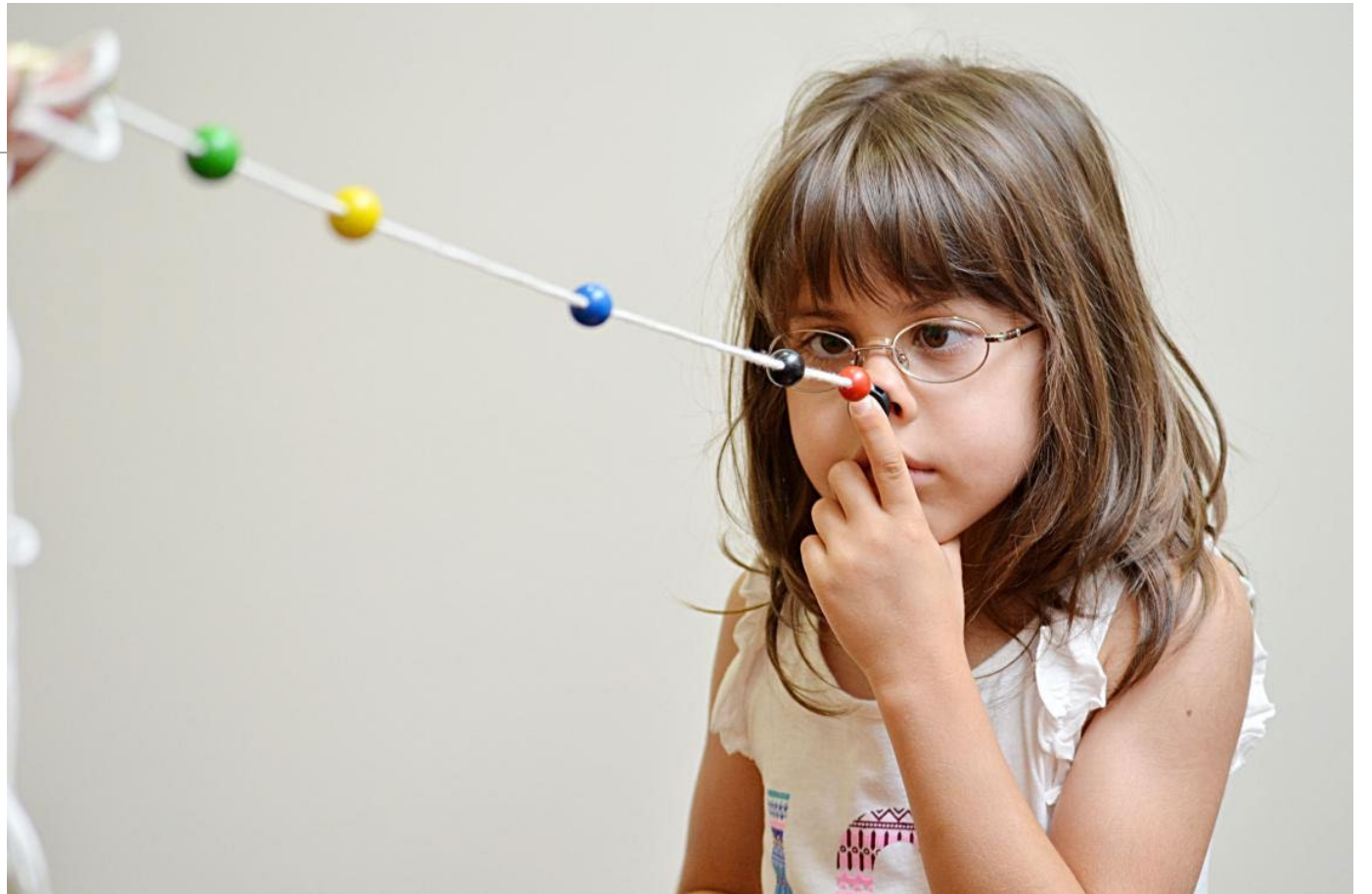Exercises with

- Paper
- String
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- Balls

Image source: https://www.seevividly.com

In-office
VR 3D TV & eye tracking

More engaging

Instant scoring

Adaptive

Image source: https://www.tobii.com

Image source https://www.vive.com

In-office

Effective

Supervised

Making appointments, time off from work, travel, etc.

Exercises (both paper and electronic are extremely fatiguing) - difficult to drive or work after.

Expensive

VR with PC was often not working – constant software & driver updates

At-home

o Paper & string exercises required a lot of effort and dedication

o My own compliance wasn't great

o If I had to do again, I'd want at home therapy with VR
- o Daily automatic scoring and sharing with therapist
- o Doing exercises before bed and not having to drive home after
- o On the device I already own for entertainment
- o Potential for physical therapy, mental health therapy as well
  - o exciting diagnostic applications with eye tracking.
- o Innovation because of new entrants from game development, fitness apps, etc.

Concern - Privacy

Intentional but undisclosed selling of data to brokers and advertisers
- to increase profit
- reduce cost and improve affordability

Much published on Privacy issues with Mental Health smartphone apps
- https://www.theverge.com/2022/5/2/23045250/mozilla-mental-health-app-privacy-analysis
- https://jezebel.com/the-spooky-loosely-regulated-world-of-online-therapy-1841791137

Greater Potential dangers of AR/VR headsets
- seeing how our eyes respond to visual stimuli
- tracking the motion of hands and heads

Concern - Privacy

Developers themselves might not be aware how data is shared.

Software libraries, toolkits, hardware platform, internet service provider, wireless provider

All might be collecting and sharing data

Medical VR App

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Medical VR App

VR headset hardware & OS

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Medical VR App

Library 1	Library/Toolkit 2

VR headset hardware & OS

Internet Service Provider

Cloud services
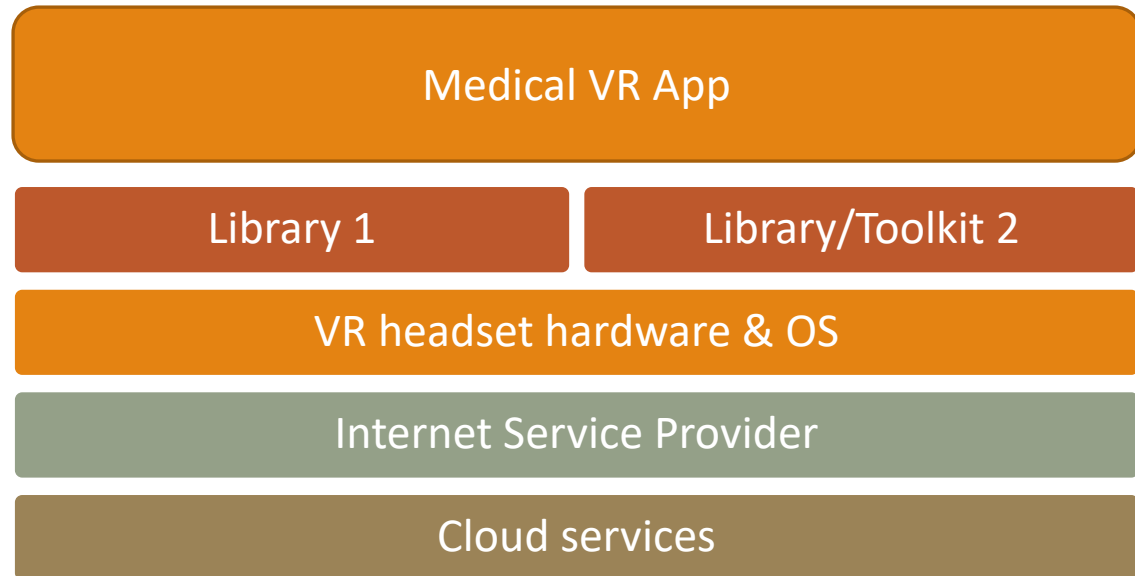
Potential mitigations?

I'm not a privacy nor regulatory expert

Existing FDA guidance on cybersecurity is having a positive impact. Increasing awareness in manufacturers and clinicians.

Could the FDA do the same for privacy?

Bill introduced June 15: Health and Location Data Protection Act