

LENS THERAPY FOR NON-STRABISMIC BINOCULAR VISION DYSFUNCTIONS

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DISCLOSURE OF FINANCIAL INTERESTS

- I have no financial interests to disclose

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GOALS

- Review Definitions of Lens Therapy and Non-Strabismic Binocular Vision Disorders
- Review Nearpoint Stress Theory
- Review Normative Data
- Review Symptoms/Presentation
- Discuss Indications and Options for testing
- Discuss Cases for Management/Therapy

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QUESTION

- Why do we check visual acuity?
- Why do we check ocular health?

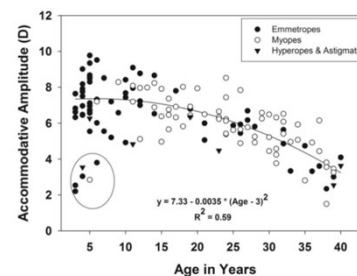
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QUESTION

- Why don't we check functional vision performance regularly?
- Many of our patients receive diagnoses they didn't know about
- Most of our patients have two eyes and have binocular diagnoses they (and we!) don't know about

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ACCOMMODATIVE AMPLITUDE OVER TIME



Anderson RA, Jensen G, Stokset A, Stoolberg KS, Menon RE. Myopia lens accommodation amplitude decreases significantly with age: a study of objectively measured accommodation amplitudes from age 3 to 40 years. Optom Vis Sci. 2003;80(12):1211-1216. doi: 10.1097/00006331-200312000-00011. Epub 2003 Nov 13. PMID: 14639342.

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DEFINITIONS

- **Lens Therapy:** application of spectacle or contact lenses as therapy to improve signs and symptoms of visual dysfunction
- **NSBVDs:** Non-Strabismic Binocular Vision Dysfunctions
 - AKA: Pretty much anything but a strabismus, including diagnoses of accommodative and motility dysfunction in the absence of a convergence diagnosis
- Amblyopia?

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DEFINITIONS

- **Compensatory Lenses:** lenses recommended to patients to account (or compensate) for existence of refractive error
 - Do not correct refractive error, as RE still exists when lenses are in place
 - May or may not provide most appropriate lens for variety of viewing distances
- **Therapeutic Lenses:** lenses recommended to patients to help create visual conditions ideal for the continuation of visual development

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DEFINITIONS

- **Convergence Insufficiency (CI):** more $XP' > XP$ than appropriate
- **Convergence Excess (CE):** more $EP' > EP$ than appropriate
- **Pseudo-Convergence Insufficiency (P-CI):** XP' or remote NPC that improves with plus
- **Divergence Insufficiency (DI)*:** more $EP > EP'$ than appropriate
- **Divergence Excess (DE):** more $XP > XP'$ than appropriate

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DEFINITIONS

- **Accommodative Spasm:** inability to adjust accommodation as needed/appropriate
- **Accommodative Excess:** excessive accommodation at near compared to appropriate values
- **Accommodative Insufficiency:** insufficient accommodation at near compared to appropriate values
- **Accommodative Infacility:** inability to accommodate and relax quickly and efficiently as appropriate
- **Refractive Amblyopia*:** reduced visual acuity in one or both eyes in the presence of an refractive amblyogenic factor and in the absence of pathology

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NEARPOINT STRESS THEORY

- Humans are not designed to perform "novel" near point work required by most modern educational programs (prolonged immobilization and narrowed focus at near)
- Visual response to stress: collapse space (~tunnel vision)
- Tendency to over-converge and localize objects as being closer to us
- Over-accommodation follows (via NPT)
- The cycle continues until it can't

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NEARPOINT STRESS THEORY

- Demand --> Stress --> Adaptation(s) (Fight or Flight)
- **Functional Vision problems are a response to visual stress**
- Stress Response Options:
 - BUFFER
 - FIGHT
 - FLIGHT

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BUFFERS TO VISUAL STRESS

- Vergence: low XP' (2-4XP')
- Accommodative: lag (+0.25 to +0.50 DS)
- Refractive: low hyperopia
- Buffer Breakdown:
 - Vergence: Over-converge (FIGHT) or Under-converge (FLIGHT)
 - Accommodative: Overaccommodate (FIGHT) or Underaccommodate (FLIGHT)
 - Refractive: Myopia (FIGHT) or Higher Hyperopia (FLIGHT)

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FIGHT RESPONSE TO STRESS

- Develop Visual Inefficiencies: Spending more time to complete the same amount of work – additional stress from fatigue!
 - Example: Oculomotor Dysfunction (committing erroneous eye movements)
- Develop Functional Vision Problems: Vergence and Accommodative Dysfunctions
 - Example: CE, DI, EP', Accommodative Excess/Spasm/Infacility

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FLIGHT RESPONSE TO STRESS

Avoid work that causes stress:

- No stress means no symptoms – problem solved!
 - Example: CI, DE, Higher XP'
 - Accommodative Insufficiency/Infacility/High Lag

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NEARPOINT STRESS THEORY

- Does a patient pick just one path?
- The purpose of testing over time
- Are we always experiencing the same kind/amount/duration of stress?
- Does plus help regardless of the path?

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WHERE PLUS COMES IN HANDY

- CE/EP': more appropriate binocular posture via NPT
- Pseudo-CI: CI with underlying Accommodative problem
 - Plus reduces stress --> more appropriate accommodative posture --> more appropriate binocular posture
- Accommodative Insufficiency (reduced amplitudes --> plus does some of the work for them)
- Higher Lag* (plus reduces stress --> more appropriate accommodative posture)
- Low PRA (reduced ability to accommodate --> plus does some of work for them)
- High NRA (indicating acceptance of more plus at near)
- High Lead* ("forced relaxation" --> not everyone is ready for this or can accept plus with lens therapy alone)

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WHAT DO THESE DIAGNOSES LOOK LIKE ON EXAM?

- Predisposition: Prematurity, Genetics, SES, (+) FHx, etc
- Signs: Remarkable Data (speed, accuracy, stamina, effort)
- Symptoms: Subjective, varying intensity, fluctuating, individual threshold for stress, resiliency, etc

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VALUABLE* DATA

- Collected under appropriate and intended testing setting
 - Using indicated lighting, working distance, lens powers, direction, etc
 - Modifications required? Document details about it
 - Consider modifications' impact on data accuracy
 - Data from a patient who can comprehend instructions correctly
 - Objective vs Subjective batteries
 - Test results depict reliability and repeatability
 - Unexpected response or result? Try it again if appropriate
- Comparing data from probe performed early in exam to probe performed later in exam to get idea about consistency, resiliency, and fatigue

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TESTING BATTERY MENU

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Accommodation: <ul style="list-style-type: none"> • Amplitudes (Donder's Push Up or Minus Lens to Blur) • Accuracy (MEM, FCC/BCC) • Range (NRA/PRA or free-space range testing) • Facility testing (+/- 2.00 DS) OD, OS, OU • Pupil response • Observation of where patient prefers to hold near reading material* | <ul style="list-style-type: none"> • Binocularity: <ul style="list-style-type: none"> • Cover Test and/or Hirschberg • Stereopsis • Near Point of Convergence (NPC) • Phorias including Maddox Rod, von Graefe, Modified Thorington (in or out of phoropter) • Vergences (Distance/Near, in or out of phoropter) • Visual Acuity OU vs OD and OS • EOM testing (strab on CT? Perform OD then OS in addition to OU) | <ul style="list-style-type: none"> • Motility: <ul style="list-style-type: none"> • Extra-Ocular Motility (OD, OS, OU if strab is present or suspected) • NSUCO testing (standing if possible) • Developmental Eye Movement • King-Devick • Readalyzer/Visigraph • RightEye or Gaze Recorder |
|---|---|--|

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TESTING BATTERY

- Do we perform all these tests at every exam?
- Play the odds?
- Use your experience!
- ASK specific questions about symptoms

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BE SPECIFIC

- Blur? Think accommodation but could also be slight blur from intermittent small angle strabismus
- Double? Think binocular/vergence
- Losing place, skipping lines, words floating? Think OMD or binocular
- Poor comprehension? Fatigue (maybe from a little bit of everything)
- Change in Working Distance? Think accommodation or binocular
- Covers one eye with relief? Think Binocular or asymmetric accommodation
- Headaches? Ask about timing and location
 - Accommodation often frontal, Binocular often temporal but not always
- Extended time to complete assignments? Could be many things!

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WHAT DO WE DO WITH REMARKABLE DATA?

- Consider repeating testing through low plus
- Why?
- Near point work increases demand for convergence and accommodation
 - Visual systems that can absorb this demand and perform as expected without undue stress are likely to have (near) normative data and/or reduced risk of symptoms
 - Why a little bit of accommodative lag and a little bit of XP' are considered acceptable (check for the buffers!)

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WHAT DO WE DO WITH REMARKABLE DATA?

- Visual systems that cannot absorb this demand develop maladaptations to help manage visual stress that may (or may not) work...until they don't
 - Misinterpretations of visual data with inaccurate and inefficient systems
 - Inaccurate and inefficient executions of functional visual skills
 - Development of symptoms with or without normative data

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HOW LOW IS "LOW PLUS"? HOW DO WE FIND ADD POWER?

- Typically less than or equal to +1.00 D
- Look at remarkable data and compare to expected
 - MEM
 - FCC
 - NRA/PRA
 - Reduced NVA
 - Trial and Error
 - Subjective Response

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HOW DO WE FIND APPROPRIATE ADD POWER?

- **MEM:** +0.25 to +0.50 DS (check major meridians) and probe with lens that makes up the difference
 - Example: A pt with an MEM of +1.25 DS would require a +0.75 DS to get them to closest range of normal
 - Test to confirm (remember: it's a quick dip!)
- **FCC:** +0.25 to +0.50; Same idea as MEM – choose a lens to get the pt to norms and retest thru proposed add
 - Consider testing setting (unnatural lighting and target and lenses in place)

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HOW DO WE FIND APPROPRIATE ADD POWER?

- **NRA/PRA:** +2.00/-2.50 (+/-0.50 for either)
 - Combine absolute values, divide by two, then rx lens that gets the pt there
 - Example: A pt with an NRA/PRA of +2.50/-0.50
 - $2.50 + 0.50 = 3.00$
 - $3.00 / 2 = 1.50$
 - To get their NRA to 1.50, they'd need a +1.00 add
 - To get their PRA to 1.50, they'd need a +1.00 add

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HOW LOW IS "LOW PLUS"? HOW DO WE FIND ADD POWER?

- Reduced NVA guide: NVAcc is 20/40?
 - Consider +0.50 or +0.75 to reach 20/20
- Trial and Error: All data near normal but symptoms exist?
 - Try +0.50 DS and retest for quality of response (increase in speed, confidence, brightness, subjective response) or retest using probe that offers measurable data
- Subjective Response (if appropriate): "What happens with this?" when you propose a lens
 - Open-ended question useful for good responders

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WHAT IF NOTHING HAPPENS WITH LOW PLUS?

- What if nothing happens? Or plus results in an underwhelming change?
- May be "stuck" or have reduced plus acceptance
- May have reached fatigue point of testing
- May not be paying attention
- If you think the plus "should" make a difference (either objectively or subjectively), you can still offer it but it may be a tough sell
- Consider monitoring or repeating testing after 2-4 weeks
- Consider other methods of intervention (hygiene, VT, lens wear schedule)

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CASE #1: WHAT AM I SEEING HERE?

- "What am I seeing here?" - 34 year old male
- CC: text seems to vibrate, worse on screens than page, fatigue and stress x years
 - BCVA 20/15 OD, OS, OU @ Distance; 20/25 OD, OS, OU @ 40 cm
 - CT: ortho/8EP'
 - AA: 4D OD, OS; 5D OU
 - Stereo: 100 sec local, (-) global
 - MEM: +1.25 DS OD, OS; dim, pt leaning forward to card
 - NPC: TTN x 3; (+) furrowing brow and holding breath

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CASE #1: WHAT AM I SEEING HERE?

- RE: Dry Distance Ret = MRx ~ HabRx
- OD: -2.25-0.50x088 20/15
- OS: -2.20x0.75x100 20/15
- Denies losing place, diplopia, honest "blur" but reports extensive asthenopia
- (+) Hx of HA x years but no pattern suggesting visual cause

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CASE #1: WHAT AM I SEEING HERE?

- Lens selected for near is +0.75 DS (due to MEM)
- Repeat Testing: thru +0.75 DS OU in flipper
 - Subjective Impression: Silent and still; off and on; starts laughing
 - NVAcc: 20/20 OD, OS; "I can even see the line below that!" (20/16 OU)
 - CT: 2EP' (from 8EP')
 - AA: 6 D OD, OS (from 4 D)
 - Stereo: 30 sec local, (+) global (from 100 sec local, no global)
 - MEM: +0.25 DS OD, OS; bright; pt still leaning toward card (from +1.25/dim)
 - Repeated sc: -0.75 DS OD, OS (removing specs isn't a great option)

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CASE #1: WHAT AM I SEEING HERE?

- Compared +0.75 DS add to +0.50 DS add
 - Improves subjective comfort without losing clarity; MEM still +0.25 and bright
 - Discuss overstress and tendency to fight but after years, system is fatigued
 - Pt volunteers: "Yeah it got worse when I started taking my son's ADHD medicine."
- Discuss options for lenses, including FT, RT, or PAL, or SV for near
- Uses 4 monitors (2x2) so SV better optio
- Also ideal as pt's vision plan requires minimum of +0.75 add

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CASE #1: WHAT AM I SEEING HERE?

- Dx: CE (8EP') and AI (4D AA); Ocular health unremarkable
- Plan: SV near for all desk work ("sit down glasses") and optional update for Distance SV specs
- FU: yearly unless problem persists
- Pt ed re: lens adaptation, visual hygiene, medication contribution, ungaslighting
- Take home:
 - Hx never ends!
 - Data lined up with accommodative problem and robust response in of
 - Delivery of LPAN matters

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CASE #2: THE FACE-STRETCHER

CC: "He started this face stretching thing. What's that about?"
 mother of 8 year old male

CC: "I'm fine. I can see just fine." - 8 year old pt

(+) Hx of moving near targets (books, worksheets, etc) to superior field and opening mouth and raising eyebrows to perform reading assignments; (-) hx of spectacle wear

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CASE #2: THE FACE-STRETCHER

- VAsc 20/20- OD, OS, OU @ Distance; 20/20- OD, OS, OU @ 40 cm (+) face stretching @ 40 cm
- CT: ortho/14XP'
- AA: 10 D OD, OS; 8D OU
- Stereo: 80 sec local, (-) global
- MEM: plano DS OD, flux from -0.25 DS to plano DS OS; dim, (+) face stretch
- NPC: 8cm/12cm with OU out; 10cm/16cm with OU out; (+) face stretch
- EOMs: FROM OU (my hand on his head)
 - Repeated without HOH: excessive head movement and closing OS on initial pass into up/right gaze

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CASE #2: THE FACE-STRETCHER

- RE: Dry Distance Ret
 - OD: +0.75-1.00x014 20/20-
 - OS: +1.00-0.75x160 20/20-
- RE: MRx
 - OD: +0.50-1.00x011 20/20
 - OS: +0.75-1.00x157 20/20+
- Denies diplopia or honest "blur";
- (+) Hx of "slow reader" who struggles with comprehension, stamina
- Has been using finger or reading window with some help
- Reduced confidence and self-esteem
- From exam three years prior (pt age 3 yrs):
"Dx: SH c CE; push page further away and reduce reading time"

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CASE #2: THE FACE-STRETCHER

- Lens selected is +0.50 DS (due to MEM and higher XP')
- Repeat Testing: thru MRx in trial frame (unstable astigmatism rx in build-a-flipper with plano on other side)
- Subjective Impression: "Hi mom! You look great!"
- NVAcc: 20/20 OD, OS, OU; pt takes off and on and flips; "Oh this one is definitely better" indicating Rx vs plano
- NPC: 6 cm/12 cm x 2 (from 8cm/12cm with OU out; 10cm/16cm); pt was in a hurry!
- CT: 12XP' (from 16 XP')
- AA: 11 D OD, OS (from 4 D); 12 D OU
- Stereo: 40 sec local, (+) forms on global (from 100 sec local, no global)
- MEM: +0.25 DS OD, OS; bright; reading enthusiastically _____

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CASE #2: THE FACE-STRETCHER

- DEM: AB: 88 seconds; zero errors; <1%ile for 8 yoa
- 174 seconds (adjusted time); <1%ile for 8 yoa
- Dx: Pseudo-CI (improved NPC and near CT thru Rx) and AI (reduced AA); Oculomotor Dysfunction
- Ocular health unremarkable
- Plan: SV near for classroom (since no decrease in DVA) and near work; remove for play
 - Demonstrated lens in trial frame and pt confirmed clearer DVA/NVA and started walking around the room
 - RTC 4-6 weeks after dispense and compliant wear to monitor behavior and data
 - Pt and parents ed re: lens adaptation, visual hygiene, medication contribution

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CASE #2: THE FACE-STRETCHER

- Follow up three months later: no more face stretching and less homework fighting
 - Also interested in trying out for wrestling team
- DEM (repeated):
- AB: 56 seconds; zero errors; average is 46 seconds
- C: 123 seconds (adjusted time); zero errors: average is 88 seconds
- Take home:
- Not sure what symptom they're talking about? Ask!
- Data lined up with accommodative problem and robust response in office
- Confirmation of improvement at follow up and monitor PRN between annual exams

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

CC: "She's really struggling in school this year. Third grade. Getting into a lot of trouble too." - father of 9 year old female

CC: "School is dumb and my dad is dumb. I can hit whoever I want." - 9 year old female

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- BCVA 20/25 OD, OS, OU @ Distance; 20/40 OD, OS, OU @ 40 cm; VERY SLOW and was working hard but would then quit
- CT: ortho/ortho' (+) furrowed brow, reduced stamina for fixation @ near
- AA: 11D OD, OS; 13D OU
- Stereo: no global, no local but test was quickly dismissed by patient
- MEM: pt shut her eyes (Photophobia? Refusal?)
- NPC: TTN x 1; (+) furrowing brow grabbed stick after first pass and did it herself

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

RE: Dry Distance Ret in free space

OD: +1.00-0.50x090-ish 20/20-

OS: +0.75 DS-ish 20/20

- Denies all symptoms but on second ask she confirms the words are too small on her homework and it makes her head hurt
- Retry MEM: very dim; no quantification
- Father starting to get furious she never told him; started yelling at each other

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- (+) irritability, (+) reduced NVA, (+) effort with near testing

- Time to cyclo!

- Returns after lunch to get Wet Distance Ret:

○ OD: +6.50 DS

○ OS: +5.75 DS

- Do we know what this Rx would do to the pt (VA, acc and bino posture) when dry?
- Do we know have an idea about how the pt is performing near work?

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- My Final Rx:

○ OD: +1.00 DS +1.00 add (RT) FTW

○ OS: +0.50 DS +1.00 add (RT)

- Captain's Final Rx:

○ OD: +5.00 DS SV FTW

○ OS: +4.25 DS SV

- Compromise:

○ OD: +1.50 DS +1.00 add FTW

○ OS: +1.00 DS +1.00 add

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- Dx: Hyperopia OU; Ocular health unremarkable

○ Questionable reliability on AA and stereo even though data collected was remarkable

- Plan: Spec wear for mostly FT but can remove for swimming

- Parent and pt ed re: adaptation; latent hyperopia and effect on behavior

- RTC 3 weeks after dispense for FU

- Letter to pediatrician and parent (concern re: changes in behavior and potential psychological testing/diagnosis)

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- Follow up 2 weeks later: "You fixed my kid!"

○ Entering VA: 20/20- OD, OS, OU, D/N

○ MRx:

▪ +1.25 DS OD 20/20+

▪ +1.00 DS OS 20/20+

- MEM thru MRx: +1.50 DS OU; brighter and got a good look (improved stamina)

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- Updated Final Rx:

○ OD: +1.25 DS

○ OS: +1.00 DS

○ +1.00 add

- Stereo through new MRx: 70 sec local; (+) forms on global

- CT: ortho/1-2XP'

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CASE #3: HAVE I ALWAYS BEEN THIS MEAN?

- Discussed updated rx or continuing with Hab Rx considering minimal change even though improved DVA/NVA
 - Decided to update and kept higher plus at home
- Long-term follow up:
 - Pt and parent ed re: adaptation and change over time
 - Suspect overall RE to reduce a bit
 - Like any non-presbyope wearing low plus, may grow out of it
 - Testing visual performance thru Distance and Near rx is necessary to determine point when pt has "grown out" of add
 - Let normative data and symptoms be your guide

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

Take home:

- Data wasn't adding up or was missing all together
- Noticed patient behavior outside of visual behavior
- Third grade!
- Fortunate no strabismus or amblyopia present
 - Different priorities to balance both VA and binocular/accommodative posture
 - Distance: most mild Rx to age-expected BCVA
 - Near: most mild Rx to age-expected Accommodative and Binocular postures

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

CC: "He started extra tutoring in reading and it's helping some but it's 10 hours a week. The tutor thought maybe he had an eye problem but he sees just fine." - Mom of 7 year old male

CC: "I see fine. Like, I can see the soccer ball fine." - 7 year old male

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- BCVA 20/20 OD, OS, OU @ Distance; 20/20 OD, OS, 20/20 OU @ 40 cm;
 - Quiet and careful
- CT: 10XP/15XP' with strong phoria viewable on UCT and re-fused with blinking; (-) diplopia
- AA: 20 D OD, OS; 20 D OU (Hmm)
- Stereo: 100 sec local; "I think there's something there" on global
- MEM: plano to +0.25 OD, OS; flux in brightness; reading very slowly (first grade words)
- NPC: 12 cm/14 cm; 12 cm/17 cm; OD out (-) diplopia
- Repeated with red lens OD: 20 cm/no recovery, (+) diplopia

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- RE: Dry Distance Ret in free space
 - OD: +2.75 DS 20/30-
 - OS: +0.75-1.00x130 20/20
- Wait a minute...
- Entering VA was 20/20 OD, OS, OU, @ D/N
- Rechecked OD thru plano: 20/60+; "That's worse."
- Technician: "He went after his brother."

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- MRx:
 - OD: +2.25 DS 20/25- (20/25+ with single letter) @ 6m; 20/40 @ 40 cm
 - OS: +0.50-0.50x110 20/20; D/N
- Hx: has a twin, born @ 37 weeks but without complications; 5 lbs, 8 oz
 - Motor milestones slightly delayed but "no concern from pediatrician, for either of them" from mom, kind of panicking
 - No academic hx of concern

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Through MRx
 - MEM: +1.75-+2.00 OD, +1.00 OS
 - NPC: 20 cm/25 cm
 - Stereo: 80 sec local; no global
 - Worth 4, Dot: Four dots/Fusion D/N
- Through +1.00 add over MRx
 - MEM: +1.00 OD, brighter; -0.25 OS, dim
 - NPC: OD out; unable to fuse to begin testing
 - Stereo: 80 sec local; no global
- Optos and viewed foveal contour and ONH through OCT while dilating

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Dx: Hyperopia OU, astigmatism OS; Convergence Insufficiency; Accommodative Dysfunction
- Ocular health unremarkable
 - What about amblyopia?
- Plan: MRx single vision for FTW (trivex); may remove for soccer
- RTC 6-8 weeks for VA check
- Pt and parent ed re: spec adaptation, Dx, visual prognosis
- PS: Brother also Dx'd with CI but without ansio

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Follow up 6 weeks later; through MRx:
 - BCVA @ 6m:
 - OD: 20/25+/- (single letter, from 20/30-)
 - OS: 20/20+
 - BCVA @ 40cm:
 - OD: 20/30 (from 20/40)
 - Repeated through +1.00 add: 20/25-
 - OS: 20/20
- Quick refraction: pt prefers no plus or minus over Hab Rx

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- CT: 5XP/12XP' still strong phoria viewable on UCT but no blinking to re-fuse; (-) diplopia
- MEM: +1.25-+1.50 OD, +0.50 OS (from +1.75 OD, +1.00 OS)
 - Repeat through +1.00D add: +0.50 OD, -0.25-0.50 D OS
- NPC: 18 cm/23 cm; OD out, (-) diplopia
- Stereo: 60 seconds local; (+) global 250 (from 80 sec local and no global)
- Dx: Hyperopia (unchanged); Convergence Insufficiency
- Plan: continue with Hab Rx for FTW (minus play/soccer); FU 8 weeks

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Follow up 13 weeks later (4.5 months after initiating spec wear)
- BCVA @ 6m:
 - OD: 20/25+ (single letter, from 20/30- and 20/25-)
 - OS: 20/20+
 - BCVA @ 40cm:
 - OD: 20/25- (from 20/30 and 20/40)
 - Repeat through +0.75 add: 20/20-, "Oh that's better!"
 - OS: 20/20
 - Quick refraction: pt prefers no plus or minus over Hab Rx

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- CT: 4XP/10XP' withOUT strong phoria viewable on UCT; (-) diplopia
- NPC: 16 cm/16 cm (from 18 cm/23 cm and 20 cm/25 cm)
- MEM: +1.00 OD, +0.25 OS (from +1.25 and +1.75 OD, +1.00 OS)
 - Repeat through +0.75 add: Brighter but no real change in value OD; -0.50 and dimmer OS
- Stereo: 60 seconds local; (+) global 250 (from 80 sec local and no global)

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Dx: Hyperopia (unchanged); Convergence Insufficiency
 - VA improving OD, along with accommodative posture and binocular posture
 - Mom reports d/c tutoring program (but was going to do that anyway) but taking less time to complete homework and nightly reading;
 - Teacher is still concerned with slow progress in reading fluency and rereading lines, even though improved

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

- Plan: continue with Hab Rx for FTW (minus play/soccer)
 - Discussed VT as complement to Spec wear; no indication of additional plus to benefit pt due to CI Dx
 - Mom and pt happy with spec wear alone and declines Sensorimotor Eval or further eye movement/tracking testing
 - RTC 3 months for progress check or sooner if problems arise
 - Consider SME depending on new performance data

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

Long-term follow up:

- Pt and parent ed re: adaptation and change over time
- Possible but not likely to see a big swing in RE
- Dilated exams yearly as long as VA asymmetry exists
- Benefit from additional intervention (LPAN or VT or both) but risk of pushing near binocular posture out of acceptable range
- Soft contact lenses an option in the future
- Let normative data and symptoms be your guide

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WHAT DOES THIS LOOK LIKE WITH PATIENT CARE?

Take home:

- Data wasn't adding up – even good kids may be dishonest (no malicious intent)
- Plus at near was helping NVA in amblyopic eye – great!
 - But it was harming Binocular posture OU and Acc posture OS – not great!
- Amblyopia: ALWAYS a diagnosis of exclusion
 - Keep in mind in every potential case, even patients with existing Dx
- High five to the tutor! Letter to tutor and teacher indicating Dx and minor accommodations

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LET'S WRAP IT UP:

- Our visual system is not designed to meet the increasing demand of near work
- Children with functional vision problems grow up to be adults with functional vision problems
- Having 20/20 vision and unremarkable ocular health is great but not enough
- Many patients (and their doctors) go so far in life without knowing there's a problem
- Asking the right questions is an easy and necessary first step to helping patients who didn't even know they needed help!
- "Plus for all!" isn't the whole idea
 - It is an accessible solution to common dysfunctions and can complement other interventions
 - It is designed to facilitate development of visual function in absence of lens therapy
- **We owe it to our profession and our patients to meet them where they are and get them to where they need to be**

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THANK YOU!

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