New Technologies, Unexpected Outcomes:

Case-Based Learning for Today's Optometrist

95286-GO **(1 hour)**

Kaitlyn Kelley, OD

kk@eawp.me

Financial and Acknowledgement Disclosure

I have received honoraria for speaking, writing, participating in an advisory capacity or research:

- Neurolens

I will keep my presentation free from commercial interest or bias. I will maintain independent control over the content of my presentation, so it is balanced, objective with scientific rigor and not for the purpose of promoting products or equipment. I agree that I will not change the basic content of the presentation following approval. All relevant relationships have been mitigated.

Course Description:

This course will introduce the idea of learning through unique and challenging cases. The course will introduce the various roles and applications of new technologies in shaping patient outcomes.

The attendees will be presented with effective assessment tools and treatments that most practitioners can start prescribing easily. The course will review a wide range of considerations to help maximize patient outcomes. Attendees will be encouraged to "Think outside the box".

Learning Objectives:

This 1 hour course will teach individuals how:

- New concept applications and theories can change our prior treatment plans
- New technologies/concepts create the need to consider process and protocol changes
- New technologies can create differentiation and specialization
- To develop strategies to overcome previous bias and become more open-minded
- To improve patient outcomes by utilizing various tools and strategies to identify needs
- To become more efficient and data driven to drive better patient outcomes
- To enhance patient outcomes, experiences, health and lifestyles by adopting new technologies

Course outline:

Introduction: The Power of Active Listening in Comprehensive Care

- The human visual system is incredibly complex, with up to 80% of our brain activity dedicated to visual processing. As optometrists, we often focus on the "see better" aspect of care, but what if we shifted our perspective to "see better, feel better"?

- Patients experiencing chronic symptoms like headaches or neck pain may seek relief through chiropractic treatments, while other patients may not relate their chronic contact lens discomfort to a systemic disease. But as optometrists, we can play a vital role in their overall well-being. By actively listening to our patients, we can identify connections between visual issues and other symptoms that may require a broader, holistic approach.

- Are we making enough referrals to other specialists to address these interconnected concerns? This presentation will explore the importance of thinking outside the box, considering advancements in technology, and working collaboratively with other providers to offer our patients the most complete care.

1. **Case: When Dry Eye Is not JUST Dry Eye Disease:**

64 yof referred by local OMD for evaluation AFTER cataract surgery due to “pasty vision”

Discussion:

a. The TFOS DEWS II Diagnostic Methodology Subcommittee examined the research evidence for tests to quantify patient symptoms, visual disturbance, tear film stability, osmolarity, tear volume, ocular surface damage, inflammation of the ocular surface and eyelid signs (such as MGD), and recommended the key diagnostic tests and techniques.

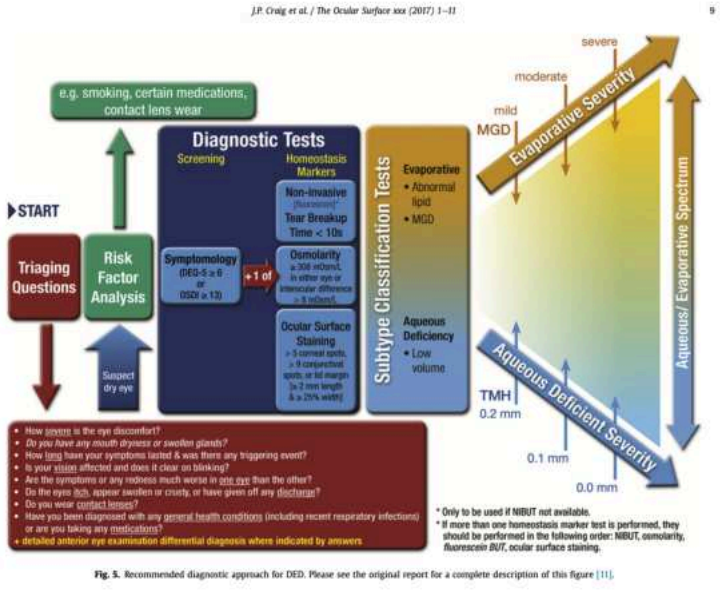
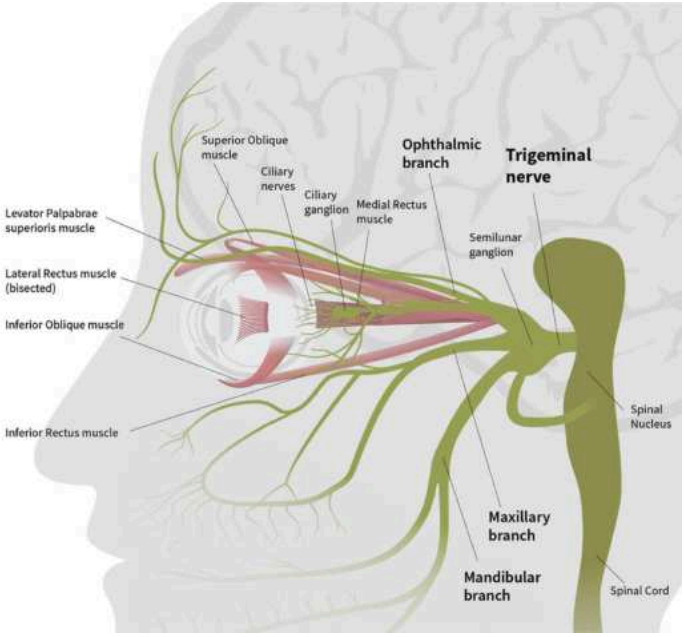


Fig. 5. Recommended diagnostic approach for DED. Please see the original report for a complete description of this figure [11].

My approach:

b. Slit-lamp exam: lid eversion, vital dyes, corneal sensitivity testing
c. Ancillary testing: Non-invasive tear break up time (NIKBUT), meibography, tear osmolarity, omega-3 index blood testing
d. Treatment:
    - lipid replenishing artificial tears
    - omega 3 supplementation
    - punctual plugs
    - warm compress
    - prescription dry eye drops
e. What worked and what didn't work: when to test and what does improvement look like?
f. Despite aggressive and various treatments, the patient's journey is still not complete. *What else do we need to consider?* Binocular visual system



- Scores on the OSDI and the CISS were positively correlated. Symptoms related to dry eye and symptoms related to a binocular vision disorders can be very similar. These findings are important because many patients suffering from dry eye-like symptoms show few or no clinical signs of ocular surface damage. Studies of dry eye should consider screening potential subjects for binocular vision disorders.If your patient is complaining of these symptoms but shows little to no ocular surface findings, be sure to perform a cover test and vergence assessment. There may be an underlying binocular issue, such as a decompensating phoria. In these cases, adding prism to the patient's glasses prescription or referring them for vision therapy may be imperative.
- Small phoria measuring device. A therapeutic progressive lens with contoured prism was prescribed.

- The result was symptom reduction and she is now able to wear contact lenses again. However, she reports more dryness relief when wearing her glasses instead of her contact lenses.

References:

1. Symptoms related to dry eye and BV disorders overlap. (Optom Vis Sci 2015;92:e214Ye221)
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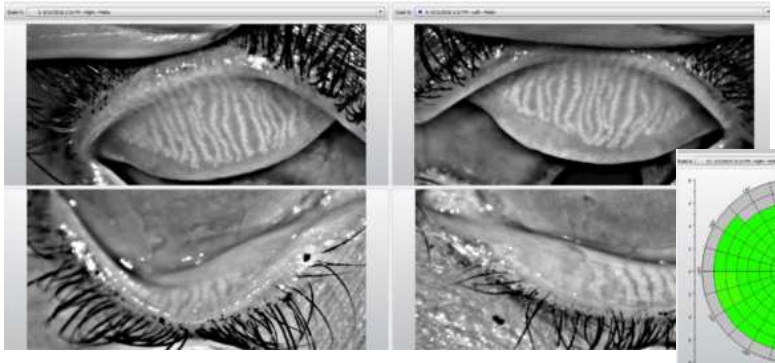
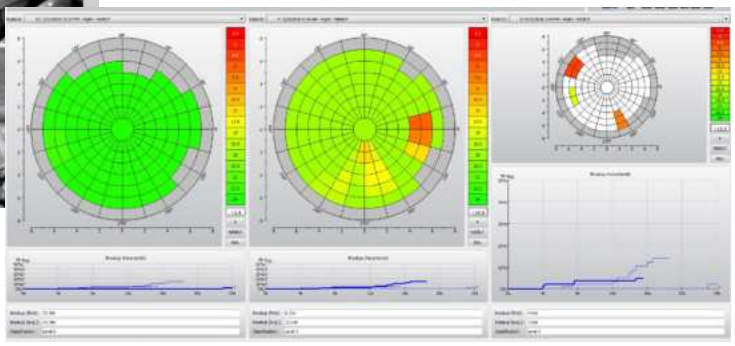
5. Hussain M, Shtein RM, Pistilli M, Maguire MG, Oydanich M, Asbell PA; **DREAM Study Research Group**. The Dry Eye Assessment and Management (DREAM) extension study - A randomized clinical trial of withdrawal of supplementation with omega-3 fatty acid in patients with dry eye disease. Ocul Surf. 2020 Jan;18(1):47-55. doi: 10.1016/j.jtos.2019.08.002. Epub 2019 Aug 16. PMID: 31425752; PMCID: PMC7004875.

2. Case: From Contact Lens Discomfort to Diagnosis: Uncovering an Autoimmune Link to Crohn's Disease

38 yof presents with complaints of discomfort with ALL contact lenses for several years.

- Testing Ordered: Non-invasive team film break-up time (NIKBUT), meibography, tear osmolarity
- Slit-lamp exam to include: lid eversion, vital dyes and corneal sensitivity testing





- What worked:
  - lipid replenishing artificial tears

- High quality Omega 3 supplement
- Short course of topical steroid
- An immunomodulator eye drop
- Warm compress + massage
- biologic eye drop

- Pt was seen every month for five months and was stable enough to wear CLs

What else do we need to consider?

- Systemic complaints: dry mouth, vaginal dryness, infertility management for 6 years, chronic diarrhea, and fatigue
- Referral to Rheumatologist was made and after 3 years she received a Crohn's Disease diagnosis
- Ongoing advancements, 2024 update- she is receiving IPL treatment for her MGD.

- What is Crohn's disease? A review
    i. Crohn's disease is a chronic inflammatory condition primarily affecting the gastrointestinal (GI) tract.
    ii. The most common eye conditions associated with Crohn's disease include:
        - Episcleritis (most common): Redness and mild discomfort in the whites of the eyes. Often self-limiting but may flare during active disease
        - Uveitis: Inflammation of the uvea (middle layer of the eye) Symptoms: Eye redness, pain, blurred vision, photophobia (sensitivity to light). Requires prompt treatment to prevent complications
        - Scleritis: Severe inflammation of the sclera (white part of the eye). Symptoms: Intense pain, redness, and tenderness. Can lead to vision loss if untreated
        - Keratopathy: Deposits on the cornea, usually asymptomatic. Rarely impacts vision
        - Dry Eye Syndrome: Reduced tear production or poor tear quality Symptoms: Gritty sensation, burning, and irritation

iii. Systemic Symptoms:
    1. Fever (particularly during flare-ups), Anemia (due to blood loss or poor absorption of nutrients), Delayed growth in children
    2. Gastrointestinal Symptoms: Persistent diarrhea (with or without blood), Abdominal pain and cramping, Weight loss and malnutrition, Fatigue and general weakness, Nausea and vomiting, Rectal bleeding, Urgency to defecate or incomplete evacuation

iv. Common Medications and their ocular side effects:
    1. Corticosteroids
    2. Tumor necrosis factor (TNF) blockers
    3. Immunomodulators

References
1. Khan A, Lightman S. The eye in gastrointestinal disease. Hosp Med. 2003 Sep;64(9):548-51.
2. Mintz R, Feller ER, Bahr RL, Shah SA. Ocular manifestations of inflammatory bowel disease. Inflamm Bowel Dis. 2004;10:135-9.

3. Case: Dismissed as a Non-Adapt: A Lens of Responsibility

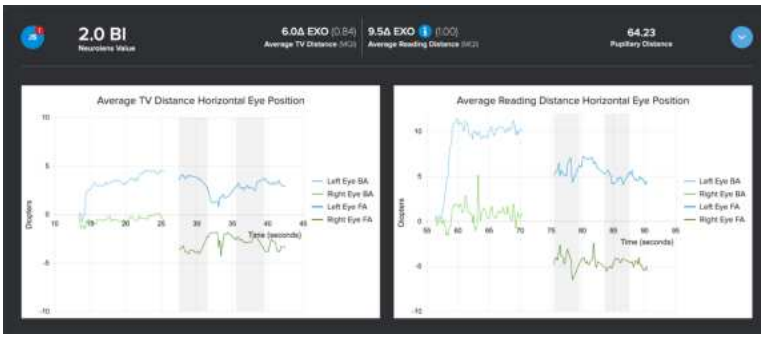
56 yom, history of progressive non-adapt with multiple attempts over the years. Complaints with progressives: headaches, pulling sensation, trouble finding the right spot to look through, and neck pain.

a. What happens when a patient does not adapt to a new prescription?
    - Expectations vs. Reality: Patient expectations of progressive lenses may not always align with their actual experience. People often expect an immediate, seamless visual experience, but the gradual transition between different powers often leads to frustration.
    - Negative Past Experiences: Prior unsuccessful attempts at using progressive lenses can lead to a negative bias, further complicating adaptation in subsequent trials. This issue is often compounded by the fact that some patients may not have been properly informed about the nature of the adaptation period required for PL lenses (Young et al., 2007).
    - Cognitive and Perceptual Adjustment: Adapting to progressive lenses requires a shift in the way patients use their visual system. The need to actively adjust head position to bring objects into focus at different distances can be cognitively demanding, particularly for those who have relied on single-vision lenses for

many years. Research has shown that patients often report initial difficulty with spatial orientation, especially with peripheral vision

- Proprioception confusion: eyes, ears, body mismatch causing over-stimulation of our nervous system : trigeminal nerve, afferent and efferent EOM pathways and upstream and downstream systems of our mid-brain
- A prospective study of symptomatic CI subjects aged 45−68 years was performed; each subject was assigned two pairs of progressive addition glasses, one with BI prism and one without prism. The subjects wore each pair of glasses for 3 weeks and then completed the CISS. The mean CISS score of 30 at baseline decreased to 13 with the BI-prism glasses and to 24 with glasses without prism. Progressive addition glasses with BI prism were found to be effective in reducing symptoms of presbyopes with symptomatic CI, at least for the short term.

a. New insight into his binocular status, with the aid of the microphoria measurements, helped guide the prescription in a new direction.
b. Standard phoria measurements both in and out of a phoropter may hide the underlying issue.



c. Prescribed new progressive lenses with contoured prism, adaptation successful
    - Traditional prescribing vs *soothing the system prescribing*

      Sheard's criterion can be used to calculate the amount of prism required to alleviate symptoms using the following formula:

      prism power = 2 × heterophoria − opposing vergence/3

      Other methods of prescribing prism include using Percival's criterion, in which the clinician prescribes prism to place Donder's line in the middle third of the graph in graphical analysis, and FD methods, in which the clinician prescribes the amount of prism that eliminates the FD (i.e., the linear associated phoria).

- Adaptation to base-out and base-in prisms differs. As expected, most people adapt faster and more completely to BO prism than to BI prism.

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1. Teitelbaum B, Pang Y, Krall J. Effectiveness of base in prism for presbyopes with convergence insufficiency. Optom Vis Sci. 2009 Feb;86(2):153-6. doi: 10.1097/OPX.0b013e318194e985. PMID: 19156012.

2. Alvarez TL, Kim EH, Granger-Donetti B. Adaptation to Progressive Additive Lenses: Potential Factors to Consider. Sci Rep. 2017 May 31;7(1):2529. doi: 10.1038/s41598-017-02851-5. PMID: 28566706; PMCID: PMC5451391.

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4. Case : The Mystery of the chronic headache patient: A 5 year journey

34 yof hyperopic patient with longtime complaints of trouble focusing and chronic headaches.

Potential Components of the Diagnostic Evaluation for

Accommodative and Vergence Dysfunction

A. Patient history

B. Ocular examination

C. Visual acuity

D. Refraction

E. Ocular motility and alignment

F. Near point of convergence

G. Near fusional vergence amplitudes

H. Relative accommodation measurements

I. Accommodative amplitude and facility

J. Stereopsis

K. Ocular health assessment and systemic health screening

L. Supplemental tests (AC/A ratio, fixation disparity/associated phoria, distance fusional vergence amplitudes, vergence facility, and accommodative lag)

Considerations:

- At each step, the patient "saw better" and reported feeling better with each adjustment I made. But each year she returned and reported that her headaches persisted.

Discussion:

a. Patients trust us and given the chance, they will seek your advice and care. Every year we should see this person just as we would a new case. What have we evaluated? What haven't we evaluated?

b. Accommodative and vergence dysfunction: Accommodative dysfunction has been reported to occur in 60 to 80 percent of patients with binocular vision problems. Was I only looking at accommodation and forgetting about her vergence system?
c. Accommodative Insufficiency, Convergence Insufficiency, Accommodative Excess, or Convergence Excess?
d. Plus additions at near may be used for the patient diagnosed with an accommodative anomaly or with an abnormally high AC/A ratio
e. The importance of collaborative care with other providers: neurology, ENT, chiropractor. Diagnosing all the root causes

References

1. Hokoda SC. General binocular dysfunctions in an urban optometry clinic. J Am Optom Assoc 1985; 56:560-2. 27.
2. Hoffman L, Cohen AH, Feuer G. Effectiveness of nonstrabismus optometric vision training in a private practice. Am J Optom Arch Am Acad Optom 1973; 50:813-6.
3. Carter DB. Effects of prolonged wearing of prisms. Am J Optom Arch Am Acad Optom 1963; 40:265-73.

5. **Case: Managing Vision in Chronic Lyme Disease: A 7-year journey to clarity**

20yof patient with Lyme Disease experiencing persistent monocular diplopia and visual strain, unresponsive to initial standard treatments.

Discussion:

- Need for a tailored approach with ongoing adjustments, requiring a commitment to longitudinal care. Multiple symptoms that evolve over time, resistant to common therapies.
- Test ordered over time:
    i. Topography

ii. Dark Adaptation Testing
iii. Visual Field
iv. Optical Coherence Tomography (OCT)
v. Microphoria Testing

- What helped:
  i. vision therapy
  ii. tinted lenses
  iii. scleral contact lens
  iv. contoured prism glasses
- What is Lyme's disease, a review.
  i. Lyme disease, a bacterial infection caused by ticks, can affect the eyes in a number of ways:
     1. Eye pain: Pain in the eye, or severe eye pain in the case of optic neuritis
     2. Inflammation: Inflammation of the middle layer of the eye (uveitis), the white part of the eye (scleritis), or the transparent membrane lining the eyelid and eyeball (conjunctivitis)
     3. Vision changes: Blurry vision, double vision, floaters, eye flashes, or vision loss
     4. Sensitivity to light: Extreme sensitivity to bright light
     5. Other symptoms: Redness, swelling, tenderness, tearing, or "static" in the visual field
  ii. Other symptoms of Lyme disease include:
     1. Erythema Migrans: A large, red, expanding bull's eye rash
     2. Fever, chills, and sweats within days to weeks after a tick bite
     3. Joint pain
     4. Muscle pain
     5. Palpitations
     6. Enlarged lymph nodes
     7. Fatigue