Practice Full Scope Primary Care Optometry: Is this Still Fun?

Pamela Lowe, OD
Practicing Full Scope Primary Care Optometry: Is This Still Fun??

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Lecture Objectives
• Look at trends that affect the profession
• Look at best practices for practicing optometry into the future
• Look at practical applications for implementing technologies
  • Great patient management is the healthiest practice management

Optometric Oath
• “I will advise my patients fully and honestly of all which may serve to restore, maintain or enhance their vision and general health.
  • I will strive continuously to broaden my knowledge and skills so that my patients may benefit from all new and efficacious means to enhance the care of human vision.”

The Why?

Disclosures
Speaker’s Bureau for:
- Alcon
- Diopsys
- Heidelberg
- Maculogix
- Optos
- Reichert
- Visionix
- Zeavision

Trends in Optometry
• Profession roots based on optics
• Practice of optometry grew to behavioral/functional vision incorporating therapy other than spectacles
• Optometry scope of medical practice grows from diagnostic only to therapeutic
• We owe it to our profession, and, most importantly our patients, to advance with technology
Trends in Optometry

• With scope of practice expansion and market place trends making the “retail” side of optometry a “commodity” our practice models must change and adapt

• Practice growth will be based on advanced technologies and converting to a medical model/alliances

Challenges/Threats

• Online eye exams

Challenges/Threats

• Online contact lens sales
**Challenges/Threats**

- Online spec Rx purchase

**Actual Impact**

- Online eye examinations
  - Less than 2% of exams

- Online CL purchases
  - Less than 20% of all CL sales

- Online spec Rx purchase
  - 3.6% market penetration
  - Nearly half of the eyeglasses (44.8 percent) had incorrect prescriptions or safety issues.

**Mandates-Super Buzz Kill!!**

- Electronic Medical Records (~32% still paper!!)
- Meaningful Use
- Practice Assessment Tools (PAT)
- Transformation Plans
- Medical Panel Inclusion/Managed Care

**IT HAPPENNED!!**

**We’re still standing!!!**

**…More mandates!!!**
How many ODs are too many??

Consider the increase in optometry schools, growing demand for eye care with the ACA and advancing technology, where will the OD workforce be in 5 years?

Let's take a different view!

AMD-The Bohemot!!

June 16, 1922-February 19, 2012
Large Unmet Need

Prevalence of AMD
- 9.2 million Americans
- 7 out of every 100 adults over 40 years old
- 1 out of every 8 adults over 60 years old
- 1 out of every 3 adults over 75 years old

Prevalence of diabetic retinopathy
- 4.9 million Americans
- 3 out of every 100 adults over 40 years old

Prevalence of glaucoma
- 2.7 million Americans
- 2 out of every 100 adults over 40 years old

Prevalence of AMD
• Up to 78% of AMD patients have irreversible vision loss at first diagnosis, including 37% who are legally blind in at least one eye
• Early AMD is not adequately detected by current methods

Preventing Unnecessary Vision Loss

Available Interventions Prior to Advanced AMD
- AREDS2 nutritional supplements lower risk of progression by 25%
- Behavior modification also lowers risk of progression

Available Interventions for Choroidal Neovascularization (CNV)
- Prompt anti-VEGF therapy can save up to 5 lines of visual acuity
- Dramatic loss can occur in as little as 8 weeks

Three Types of AMD

• Subclinical AMD
  - Earliest stage detected by increased Rod Intercept time through dark adaptation testing

• Dry or non-exudative AMD
  - Most common form, usually slower progression and important to watch for any conversion over time

• Wet or exudative AMD
  - Less common affecting about 15% of those with AMD with early intervention being key to better visual outcomes

AMD Prevention

- As primary care doctors, identifying those at risk while vision is normal and patient is asymptomatic IS THE MOST EFFICIENT time to treat.

ROLE OF MACULAR PIGMENT OPTICAL DENSITY (MPOD)
Call for Prevention!!!!!

When is the time to talk about macular health??

- NOW

- Blue-violet is everywhere and affects all patients
- Youth have greatest BV exposure!!!
  - Cell phones, tablets, computers
  - Sunlight
  - Television, indoor lighting

DIETARY CAROTENOIDS (LUTEIN / ZEAXANTHIN)

MINIMIZE

BLUE LIGHT INSULT

Blue light absorption: Macular Pigment

Turn Key Private Pay Revenue “Blue Light” Model

The Lens Market Has Embraced Blue Light Protection
AMD - Risk Factors

- Family History
- Age
- Gender
- Cardiovascular Disease
- Genetics
- Obesity & Poor Diet
- Low Macular Pigment

AMD Lifestyle Risks

- **Smokers** - educating and recommending cessation strategies
- **Obesity & Poor Diet** - educating and recommending diet/exercise strategies
- **Low Macular Pigment** - educating and recommending measurement

Smoking Cessation

- Cold turkey
- Psychological
  - Hypnosis
  - Emotional Therapy
- Pharmacology
  - Dermal Patch
  - Oral
  - Gum - Nicorette
  - Capsules

The Crisis - Obesity

- Today two-thirds of adults and nearly one-third of children struggle with overweight and obesity.¹
- If obesity rates stay consistent, 51 percent of the population will be obese by 2030.²
- Twenty years ago, no state had an obesity rate above 15 percent. Today there are 41 states with obesity rates over 25 percent, according to the Trust for America's Health.³
- Since 1980, the rate of obesity in children and adolescents has almost tripled.⁴
- 72% of older men and 67% of older women are now overweight or obese.²²

http://www.obesitycampaign.org/obesity_facts.asp

The Crisis - What We Put In!!

95% of Chronic disease is caused by food choice, toxic food ingredients, nutritional deficiencies and lack of physical exercise

The Standard American Diet (SAD)

- Processed Meat: 35.1%
- Junk Food: 35.1%
- Sodas: 12.2%
- Sweets: 6.2%
- Milk: 6.2%
- Fruits: 0.0%
- Vegetables: 0.0%
- Whole Grains: 0.0%

**SURGEON GENERAL'S WARNING:**

The Standard American Diet causes approximately two-thirds of the deaths due to disease in America.
The Crisis-Movement (lack there-of)

- Less than 15 percent of school-aged children walk or bike to school today, compared to 48 percent that did in 1969, according to the Safe Routes to School Partnership.
- Only 4 percent of elementary schools, 8 percent of middle schools and 2 percent of high schools provide daily physical education for all students.
- Approximately 50 percent of U.S. adults and 65 percent of adolescents do not currently get the recommended amount of daily physical activity.

http://www.obesitycampaign.org/obesity_facts.asp

The Relationship between Lutein and Zeaxanthin Status and Body Fat

"Higher body fat percentage, even within relatively healthy limits, is associated with lower tissue LZ status. The results indicate that adiposity may affect the nutritional state of the retina. Such links may be one of the reasons that obesity promotes age-related degenerative conditions of the retina."


How to Best Move

- Cardiovascular Training (heart rate up 20-30min, 3-4x/week)
  - Steady State
  - Interval Training
  - High Intensity Interval Training
- Resistance Training (20-30 minutes 2-3x/week)
  - Important for bone density and joints
  - Increases muscle endurance and strength

Cardiovascular Training (3-4x/week)

- Steady State
  - Constant moderate pace 20-30 minutes
- Interval
  - Equal cycles of high-pace/moderate-pace (2-3min intervals)
- High Intensity Interval
  - 4-6 cycles of 30sec/4min high intensity/steady state moderate
  - Lowers BP, cholesterol, BS more efficiently than SS or interval

Resistance Training (2-3days/week)

- 40-60% of 1 repetition max is recommend weight (adjusting for injury or age)
- 8-10 different moves (i.e. circuit training of muscle groups)
- Repetition range of 8-12 is recommended for healthy participants younger than 50-60yo and 10-15 repetitions at a lower relative resistance for cardiac patients and healthy participants older than 50-60 years.
  - Important to establish good cardiovascular habits first
MPOD Testing

- Any patient at risk should be educated and consider measurement
- Proactively identify during pre-testing
  - Utilize questionnaire
  - Pre-tester determination
- Complete testing where best in your patient flow
  - End of entrance tests prior to doctor exam
  - End of full exam per doctor recommendation

Macular Pigment and AMD Risk Factors

- Risk factors:
  - Low Dietary Consumption of key carotenoids
  - Low Macular Pigment Level
- Increased Risk of AMD

Prescribing Supplements for AMD

- ROLE OF DARK ADAPTATION IN AMD

Problem with the Rods

- Histopathological studies on human donor retinas with AMD indicate a predilection for parafoveal loss of rod photoreceptors over cones in early nonexudative disease
- DA studies have shown more delays in rod-mediated parameters of dark adaptation, while cone-mediated parameters are much less affected
Cholesterol accumulation leads to para-panmacular deposits (BlinD and BlamD). Peaks in these deposits eventually become clinically visible drusen. These extracellular cholesterol deposits affect photoreceptor health, causing inflammation and predisposing to CNV. In addition, they impair normal transport, including that of vitamin A, across Bruch’s membrane.

In effect, AMD causes a localized deficiency of vitamin A, and dark adaptation is the best test to measure this change.

First Symptom of AMD
Night vision impacted in early disease: 20+ studies
AMD patients often give up driving at night
Night vision is impaired before day vision
Difficult to determine whether night vision is impaired because of AMD or aging

ADAPTDX® OVERVIEW
First dark adaptometer for rapid, routine clinical use
Simple, objective tool to measure dark adaptation as earliest functional correlate of macular dystrophies
Two clinical protocols
- ≤6.5-minute rapid test (for quick assessment)
- ≤20-minute extended test (for benchmarking)
**How AdaptDx® Works**

Simple, noninvasive test performed in-office by ophthalmic technician.

While continuously focusing on fixation light, patient is exposed to a mild bleaching flash and asked to indicate when a progressively dimmer stimulus light appears (randomly timed).

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**Dark Adaptation**


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**AdaptDx® Diagnostic Study**

Multisite study
Sample consisted of 127 AMD patients and 21 normal adults
Clinical diagnosis confirmed by retina specialist grading fundus photographs


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**AdaptDx® Diagnostic Study Results**

- Patients classified as having AMD if dark adaptation >6.5 minutes
- High sensitivity: correctly identified 90.6% of confirmed AMD cases
- High specificity: correctly identified 90.5% of confirmed normal cases
- High overall accuracy of 90.6%
- AMD cases exhibit no rod recovery of dark adaptation
- AdaptDx rapid test – ideal for routine clinical use

How Good Is 90%?

Visual field testing to detect glaucoma is 83% sensitive and 95% specific

Retina specialists using slit lamps to detect AMD are 82% sensitive and 91% specific


Dark Adaptation for Cataracts??

• Can DA be used as a screening method for macular pathology in patients with normal fundus exam undergoing cataract surgery evaluation?

• Such screening is needed since multifocal intraocular lenses (MFIOL) may reduce contrast sensitivity and impair visual function in patients with subclinical macular disease.

Using Dark Adaptation Time to Assess Macular Function Prior to Cataract Surgery

Marta McKeague MD, Mark F. Pyfer MD

68th Annual Wills Eye Conference Free Paper Session
March 10th, 2016

Methods

• Retrospective study
• Comprehensive ophthalmology practice
• Identified all patients that underwent dark adaptation testing within a 13 month period
• Selected those that would have been considered candidates for MFIOL
• Prevalence of delayed dark adaptation in this group

Results

• Among pts who were all considered good MFIOL candidates, about 1/3 had abnormal DA and there were no other features to identify who these patients might me.
Results

<table>
<thead>
<tr>
<th>Normal Dark Adaptation</th>
<th>Abnormal Dark Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Adaptation Test Result</td>
<td>17 eyes</td>
</tr>
<tr>
<td>Mean Age</td>
<td>69</td>
</tr>
<tr>
<td>Gender</td>
<td>65% female</td>
</tr>
<tr>
<td>OCT Central Macular Thickness</td>
<td>261 μm</td>
</tr>
</tbody>
</table>

Normal Dark Adaptation
Abnormal Dark Adaptation
Mean Age 69 79 *p = 0.018
Gender 65% female 80% female p = 0.46
OCT Central Macular Thickness 261 μm 257 μm p = 0.789

Conclusion

• Abnormal dark adaptation is a potential marker of subclinical macular dysfunction among patients who are otherwise deemed good candidates for MFIOL.

Limitations

• Selection bias toward patients with macular pathology
• Small sample size
• Retrospective nature

Future Work

• Prospective study of frequency of abnormal DA in MFIOL candidates
• Correlation between MFIOL intolerance or dissatisfaction and abnormal DA

Findings Increasing Risk of Vision Loss

• Retinal
  – *Low MPOD
  – Peripheral drusen
  – Macular changes
  – Diagnosed AMD
  – *Sub-clinical AMD

When do you take a deeper dive into genetics?
Genetic Testing for AMD

Genetic Testing results to determine maximum preventive treatment plan:
1. 2.5 & 10 year risk
2. Lifetime risk
3. Targeting nutraceuticals

Lab directly bills Medicare patients and any insured patient with only a $50 co-pay.
Vita Risk only is NOT billable to insurance and costs $500.00.

Macular Risk Assessment Test

Macula Risk® - Vita Risk®
AMD GENETIC TESTING & AREDS PHARMACOGENETICS

Artic Lab Office Locations

Toronto, Canada
Grand Rapids, MI

No Cost Office Kits

Codes for Genetic Testing

- All AMD codes and peripheral retinal reticular degeneration codes
- Serous and hemorrhagic RPE detachment codes
Macula Risk & Vita Risk

Who Will Lose Vision
Macula Risk®
2, 5, 10-year Prognostic
Vita Risk™
AREDS Pharmacogenetic

Macula Risk Genes

Protein Phosphatase 2 (PPP2A)
Protein Phosphatase 1 (PPP1)
Phosphatidic Acid Phosphohydrolase (PAH)
Vitamin B6 (Pyridoxine) (B6)
Vitamin B12 (Cobalamin) (B12)

case

Macula Risk - Prognostic Validation - 2012 IOVS

Prospective Assessment of Genetic Effects on Progression to Different Stages of Age-Related Macular Degeneration Using Multistate Markov Models
Yi Yu, Robyn Reynolds, Bernard Rosner, Mark J. Daly, and Johanna M. Seddon
2560 Caucasians
Average Follow up = 10.3 years
5 year predictive power = 0.883 ‘C’ Statistic Score
10 year predictive power = 0.895 ‘C’ Statistic Score

Macula Risk improves Outcomes
American Society of Retina Specialists
Annual Meeting – August 2013
Peter Sonkin MD, Tennessee Retina

CNV Cases = 2,105 Eyes
Average Visual Acuity at Presentation

Without Genetic Analysis
20/145
With Genetic Analysis
20/77

Combining Clinical Exam and Genetics

Macula Risk Patient Report
Primary Eye Care Protocol

Macula Risk Advisory Panel Recommendations
Risk Stratification by Macula Risk (ARM) Score and Disease Stage

<table>
<thead>
<tr>
<th>ARM Risk Score</th>
<th>ARM Stage</th>
<th>Risk Stratification</th>
<th>AREDS Photoprotective Regimen</th>
<th>OUT</th>
<th>Reduction in Progression</th>
<th>AREDS To Neutral Progression</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM 1</td>
<td>Early AMD</td>
<td></td>
<td>AREDS 2 Ocular Vitamins</td>
<td></td>
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<tr>
<td></td>
<td>Intermediate AMD</td>
<td></td>
<td>AREDS 2 Ocular Vitamins</td>
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<tr>
<td>WM 2</td>
<td>Early AMD</td>
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</table>

AMD Treatment - Standard of Care

Dry AMD

AREDS 2 Ocular Vitamins
- Vitamin C (200 mg), Vitamin E (400 IU), Zinc (80 mg), Lutein (10 mg), Zeaxanthin (2 mg), Copper (2 mg)

Wet AMD

VEGF Inhibitor Injections
- Avastin (bevacizumab)
- Lucentis (ranibizumab)
- Eylea (aflibercept)
- Steroids, Visudyne, Macugen...

Personalized Medicine

Genetic Testing for Supplements - Why?

Genetic Variation Determines Treatment

AREDS Study (2011)
17% risk reduction
21% risk reduction
25% risk reduction

Are patients with 2 C9orf72 risk alleles and 0 ARMS2 risk alleles should not take the AREDS formulation.

Take Home Message (15%)

Potential Dangers From Zinc (and Copper) Supplementation: Implications for Alzheimer Disease and AMD

A closer look at the data.

BY JESSICA KAPP, PH.D. AND JEROME SHERMAN, OD
**Recommendation - Personalized Medicine**

**Are Eye Vitamins Helpful or Harmful?**

**AREDS Eye Vitamins: NOT Safe And Effective In All Patients**

<table>
<thead>
<tr>
<th>AREDS vs PLACEBO</th>
<th>AREDS</th>
<th>Total</th>
<th>Placebo</th>
<th>Total</th>
<th>Hazard Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison in patients with 2 C1R and 6 AKR24 genetic risk alleles</td>
<td>Progression in AREDS</td>
<td>Progression in PLACEBO</td>
<td>Progression in AREDS</td>
<td>Progression in PLACEBO</td>
<td></td>
</tr>
<tr>
<td>Patients treated with AREDS had a 79% increase in progression to Advanced AMD</td>
<td>61</td>
<td>10</td>
<td>62</td>
<td>11</td>
<td>1.79</td>
</tr>
</tbody>
</table>

Genetic Test All Patients Before Prescribing AREDS

www.macularisk.com

**Follow-up Recommendation - Retinal Findings**

- Retinal findings increase risk and need for prevention with vitamin recommendation
- Retinal findings need greater monitoring of structure and function
- Structure: Fundus imaging, Auto-fluorescence, OCT
- Function: Preferential Hyperacuity Perimetry (PHP), Microperimetry, pERG, dark adaptation

**Coding/Billing Structure/Function**

- Fundus imaging/Auto-fluorescence-92250 -$83.04
- OCT-92132,92133,92134 -$44.76-$45.88
- PHP-92083 -$69.13
- Microperimetry-92083 -$69.13
- pERG-92275 -$168.59
- Dark adaptation-92264 -$64.80
Are we having fun yet??

Case Study

- 30yo a Hispanic female presents (referral from her boyfriend, a long-time patient) c/o red, burning, itchy eyes.
- Works in kitchen around chicken fryers reporting burning, itchiness subsides when gets home from work but redness is persistent and cosmetically unacceptable
- Reports good general health, no Hx of surgeries with normal BP and NKA to drugs or environment
- Meds: Estradiol (Pt. denies irregular menses, osteoporosis or peri-menopausal issues)

Hormone Replacement/Eyes

- Increased risk for dry eye
- 69% higher in women receiving estrogen alone
- Longer duration of HRT the higher risk of dry eye
- What stands out for this patient??

Begs the question: WHY?

- Why would a young, healthy, non-menopausal women take estrogen replacement therapy??
- A patient in gender transition

Transgender Patient Care

- The Numbers:
  - 5-10% of patients may be gay, lesbian or bisexual
    - Other than sensitivity to social needs does this change the way we clinically care for the patient?
  - Additional patients may be transgender, intersex or questioning
    - Along with sensitivity to social needs does this change the way we clinically care for the patient?
    - Transgender may use hormone Tx to change outward features and/or surgical procedures to change genitalia
Transgender Patient Care

- Transgender definition: People whose gender identity differs from the sex the doctor marked on their birth certificate. Gender identity is a person’s internal, personal sense of being a man or a woman (or someone outside of that gender binary).
  - Transgender in the U.S. is approximately 0.3% or 700,000 adults.
  - Approximately 20% of those seek surgical intervention.
  - Don’t confuse transgender with sexual orientation or intersex. Intersex is one born with ambiguous genitalia (anatomy) that is not considered male or female.

- A survey of roughly 3000 trans women showed:
  - 23% identified as heterosexual
  - 31% as bisexual
  - 29% as lesbian
  - 7% as asexual
  - 7% as queer
  - 2% as “other”

- According to the American Civil Liberties Union, discrimination is prohibited in:

- Anti-discrimination Laws in Only 18 States

- Attempted Suicide

- Creation and Implementation of Policies

- The first lawsuit has been filed under the Affordable Care Act
  - A transgender male was treated abusively in an ER
  - How do we appropriately chart?
    - Education/training for docs and staff
    - EHR systems are NOT transgender friendly
    - A patient in transition is in “no man’s (person’s) land”
    - Official documents do not correspond with gender identity

- Transgender Individuals in the Military

- A 2014 report from the Williams Institute estimates that there are over 15,000 transgender individuals serving on active duty and there are over 134,300 transgender veterans. According to their data, 32% were assigned male at birth and 5.5% were born female.
Case Study—Dilemma

• I needed to prescribe an allergy drop BUT the patient presents female with government issued documents still identifying her as male with a different name
• Insurance documents still have male status
• Patient presents female and wants all records to accurately define her as her chosen gender
• E-prescribing does not allow me to Rx in the appropriate gender to correspond with government/insurance documents

Primary Care OD Role

– No judging, stereotyping
– Treat symptoms and medical status
– Be aware of the proper gender and name to address your patient
  • Always ASK patients how they define themselves, and respect and USE their preferred self-definitions and pronouns appropriate to their gender identity.

Primary Care OD Role

• Stay true to what optometry does best…care for all patients with compassion
• Educate staff on proper protocol and document the best you can
  • MTF-Male to Female
  • FTM-Female to Male
• Treat with dignity all patients deserve

Primary Care OD Role

“Tranny / transie: slang terms for transgender or transsexual. Some people find these highly offensive, while others may be comfortable with them as a self-reference, but consider them derogatory if used by outsiders. It is recommended that health care providers avoid using these terms when speaking with or about transgender patients.”

– Let the patient know you are there for all their ocular health needs and your office will provide them with consistent, top notch care

Our commitment to our patients/practice

• Great patient management is the healthiest practice management

“Working hard for something we don’t care about is called stress; working hard for something we love is called passion.”

Simon Sinek
HAVE FUN AGAIN!!

Enjoy the ride!

• plowe@proeyecarecenter.com