Innovations in Dry Eye and Primary Eye Care

Greg Caldwell OD, FAAO
Optometric Education Consultants
Twincities Power Hours
April 19, 2020

Disclosures
Greg Caldwell, OD, FAAO

Will mention many products, instruments and companies during our discussion.
I don’t have any financial interest in any of these products, instruments or companies.
Pennsylvania Optometric Association -President 2010
POA Board of Directors 2006-2011
American Optometric Association, Trustee 2013-2016
Thank you to the members and those who join
I never used or will use my volunteer positions to further my lecturing career
Lectured for: Shire, BioTissue, Optovue, Alcon, Allergan, Aerie, Sun
Advisory Board: Allergan, Sun, Takeda
Freelance: PA Medicaid Director - Credential Committee
Optometric Education Consultants- Scottsdale, Quebec City, and Nashville - Owner

Financial Obligations

Course Description and Learning Objectives

This course will reveal, feature, and spotlight innovations in dry eye and primary eye care that will impact every optometrist. Technologies, pharmaceuticals, products, services, and processes that advance eye care will be discussed in a rapid-fire presentation. This course will keep you "in the know" for delivering advanced patient care.

- Introduce the innovation to the clinician in each of the topic areas
- Discuss how the innovation will impact the diagnosis and treatment in eye care
- Reveal the benefit of embracing the innovation
- Demonstrate how it will impact patient care
- Demonstrate how to integrate the innovation into the clinician’s practice
- Enhance the clinician’s knowledge of selected innovations that impact eye care

How Many People With

- Diabetes
- Thyroid
- Glaucoma
- Dry Eye
- 30 million

Experts Gather for Recommendations and Algorithms

- Corneal, External Disease, and Refractive Society
- Dry Eye Workshop II (TFOS DEWS II)
- Delphi Panel International Task Force
- Delphi Panel
Vital Dyes

- Fluorescein
  - Detects disruption of intercellular junctions
  - Faint, even staining
  - Positive (stain) - pooling
  - Negative (stain) - high or elevated areas

- Rose Bengal and Lissamine Green
  - Stains devitalized cells and cells that have lost normal mucin surface
  - Detects abnormal epithelial cells
Why are Conjunctival Staining and SPK Often Missed or Under Scored?

Wratten Filter

Aqueous Deficient vs Evaporative

What’s the common denominator?
- Eye burn/discomfort/pain
- pH

What’s the next question?
- When is it worse?
  - AM/PM

AM: bacteria/parasite related
PM: aqueous deficient

Let’s Focus on Evaporative

48 year old man
OU red, gritty, sandy and dry feeling

Current Correction

VA 20/20
20
CC 20

EOMS: full, unrestricted
CT: ortho D/N
PERRL (-)APD
CF: full by FC OU

Diagnosis
- Rosacea

What findings support your diagnosis?
- Telangiectasias
- Erythema of the cheeks, forehead and nose
- Rhinophyma
- Superficial vessels

Let us get a closer look
Meibomian Gland Dysfunction
Exacerbated by Rosacea
Evaporative

- Treatment?
  - Warm compresses
  - Lid hygiene
  - Artificial tears
  - Omega 3 fatty acid
  - EPA and DHA total 1500 mg (1000 mg minimum)
  - Dermatological consult (Acne Rosacea)
  - Oral antibiotics...???
  - Which one and why?

Meibomian Gland Secretions
(Lipid)

Prostaglandins
Thromboxines
Lipase

Marginal Foam
(Soap)

Tu r b i d
Inspissated MG

Status of MG

Minocycline / Doxycycline
Drug of choice for MGD, marginal inflammatory blepharitis (posterior blepharitis)
- A8, anti-inflammatory and anti-collagenase
- Inhibits lipase enzyme
- No renal adjustment
- 50-100 mg qd-bid 2-12 weeks (pulse)
  - Lower maintenance dose
- 20 mg Periostat (Doxycycline)
  - Helpful in those with stomach or GI sensitivity
  - Excellent for those requiring long maintenance dose

Minocycline / Doxycycline Paradigm
- Maximum dosage for 2-12 weeks (pulse)
  - 100 mg BID, QD
- 50-100mg qd while turbid
- 20 mg longer treatments
  - Periostat (Doxycycline)
- 20 mg if maintenance dose needed

Status of MG

Inspissated

Turbid

Clear

Clinical Pearl
Treatment Failure
- If you continue to think of doxycycline and minocycline as antibiotics, treatment failure will be the result
- From this point on consider them a steroid

Hyclate vs Monohydrate
- I get calls from the pharmacist
  - Doxycycline
    - Doryx
      - Enteric coated hyclate pellet
    - Addax
      - Hyclate
  - Adoxa
    - Monohydrate
What is an Inspissated MG?

I Can’t Believe It’s Not Butter!® Squeeze

2016 Treatment
Current Precautions and Innovative Changes?

- Warm Compresses
- Salt Scrubs
- Artificial Tears, Systane Balance
- Omega 3 (1500 EPA and DHA)
- Minocycline 100 mg PO 6 weeks, 50 mg 3 months, 20 mg maintenance (Doxycycline)
- Prednisolone, Tobradex qid (5 weeks with taper)
- Moderately red and thickened lid margins
- Margin reefing

Precautions with Oral Tetracycline Analogs

- Tetracycline analogs
  - Doxycycline
  - Minocycline
- Enhanced photosensitivity
- Avoid in children and pregnancy (Category D)
- Enhances the effects of
  - Coumadin
  - Digoxin
- Idiopathic intracranial hypertension
- Hyperpigmentation

Benign intracranial hypertension
“It’s not rare if it’s in your chair”
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April 19, 20/20

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Fluoroquinolones

- Have been associated with retinal detachment
- Not tetracycline analog

Innovations

Dry Eye Disease

Procedures Currently Represent 4% of all US Dry Eye Revenue

- Revenue for Dry Eye Products by Segment
  - Procedures AM, plugs, Lipiflow, Mibifo

"Newer dry eye procedures offer the most significant potential for market growth."
- Market Scope

Heat to the MG

What has changed?
What is new?
Is it better you decide

Bruder Moist Heat Eye Compress

- Moist heat treatment
- Stabilize the tear film, improve oil gland function, slow tear evaporation
- Ready in seconds, easy to use
- Patent compilation available
- Patented MediBeads: Self-hydrating (no need to add water)
- Antibacterial and non-allergenic
- Washable and reusable
- Safe for frequent use
- Microwave for 20-25 seconds
- Unique pod design provides improved fit and performance
Dry Eye Relief and Daily Eyelid Hygiene

Micro-fine sheets are designed to cleanse the eyelids.

Bruder Cold Therapy Eye Compress

Mibo Thermoflo

- Ultrasound gel, heat, skin
- Comfortable treatment, no pressure
- No disposables (ROI for the practice)
- Technician driven eliminating the need to burn the doctors chair time
- Dry eye maintenance
- Pricing for patients is more affordable than other options making the treatment more easily accepted by patients.

Mibo Heating Pad

- 5 settings
- Aromatherapy
  - Lavender
- USB powered

Personalized Open Eye Experience

For those who suffer from dry eye disease, TearCare® is the most personalized procedure that offers a savvy approach.

- Natural blink design
- Ultra-precise meibomian gland clearance
- Patented smart system

Pharma Update
**Nuzyra™ (omadacycline)**
- Tetracycline antibiotic
- Approved 2018
- Approved for PO/IV treatment of patients
  - Bacterial skin infections
  - Community-acquired bacterial pneumonia
- ADRs:
  - Nausea, vomiting, diarrhea, constipation, insomnia
  - Chelation issues JUST like other tetracyclines!

**Seysara™ (sarecycline)**
- Tetracycline drug
- Approved 2018
- Indicated for the treatment of inflammatory acne in non-nodular, moderate to severe acne vulgaris
- Potential for MGD treatment
- Can be taken WITH or WITHOUT food!
- ADRs: nausea

**Xerava™ (eravacycline)**
- Tetracycline antibiotic
- Approved 2018
- Indicated for the treatment of intra-abdominal infections in adults
- IV ONLY

**Xiidra™ (lifitegrast) 5%**
- Company: Shire
  - Approved July 2016
  - Specific treatments/indication: dry eye disease
    - Signs and symptoms of dry eye
    - Dosage: one drop twice daily in each eye, 12 hours apart
    - Dysgeusia, site irritation, blurred vision
    - Relief as soon as 2 weeks with symptoms
    - Eye Dryness Score
    - Signs improve as soon as 12 weeks
    - Inferior cornea staining

**Xiidra™ (lifitegrast) 5%**
- Mechanism of Action
  - Lymphocyte function-associated antigen-1 antagonist
    - LFA-1 is found on the T cell
    - Blocks ICAM-LFA-1 interaction
    - Intercellular adhesion molecule-1
    - Cornea, conjunctiva, lacrimal gland
    - Anti-inflammatory by inhibiting
      - T-cell activation
      - T-cell migration
      - Cytokine Release
- Xiidra™ or Restasis™? Or BOTH!
  - Yes, based on Mechanism of Action (MOA)
  - Need more longitudinal data from post-marketing surveillance to determine
    - Efficacy and toxicity as an individual drug
    - As well as efficacy and toxicity as compared to Restasis
Indication:
A calcineurin inhibitor immunosuppressant indicated to increase tear production in patients with keratoconjunctivitis sicca.

Warnings and Precautions:
Potential for eye injury and contamination: To avoid the potential for eye injury and contamination, advise patients not to touch the vial tip to the eye or other surfaces.

Adverse Reactions:
The most common adverse reactions reported in greater than 5% of patients were pain on instillation of drops following administration of CEQUA ophthalmic solution.

Use with Contact Lenses: CEQUA should not be administered while wearing contact lenses. If contact lenses are worn, they should be removed prior to administration of the solution. Lenses may be reinserted 15 minutes after administration.

Potential for Eye Injury and Contamination: To avoid the potential for eye injury and contamination, advise patients not to touch the vial tip to the eye or other surfaces.

Note:
OTX LS, least squares; SE, standard error.
Hygiene Solutions

What has changed?
What is new?
Is it better you decide

Hypochlorous Acid

- Natural antibacterial agent
- Found in white blood cells
- Differs in mechanism of action from antibiotics
- Oxidant, bactericidal
- Skin microbiome contributes to infection, blepharitis, and MGD
- Staphylococcus aureus, Staphylococcus epidermidis, Corynebacterium, and Propionibacterium acne

HyClear™ (hypochlorous acid 0.1%)

HyClear™ is Pure
HyClear is a non-cytotoxic, non-irritating solution recommended for daily use
HyClear™ is Stable
HyClear provides up to an 18 month shelf life after opening
HyClear™ is Effective
HyClear kills the majority of ocular pathogens in seconds

Nutraceutical Therapies

What has changed?
What is new?
Is it better you decide

Nutraceutical Therapies in Dry Eye

- Looking for anti-inflammatory fatty acids
- Dry eye efficacy
- "Fish oil" will provide nice hair, nails, and skin
- Gamma-Linolenic Acid GLA
- Specific action that "fish oil" omegas lack
- 7 randomized controlled trials for dry eye
- Post-menopausal women (HydroEye) (Sheppard JD, Pflugfelder SC, et al. Cornea 32:1297–1304, 2013)
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Nutraceutical Therapies

- **Prostaglandins**
  - Myth buster—they are not all bad
- **Prostaglandin E1 (PGE 1)**—good
  - Shown to stimulate lacrimal production (Phalpramool, 1980, 1983)
  - Supports mucin production
  - Stimulation of vitamin C, a required cofactor for PGE 1
- **Prostaglandin E2 (PGE 2)**—bad
  - Precursor AA
- **Prostaglandin E3 (PGE 3)**—good
  - Precursor Omega-3 "fish oil"

Gamma-Linolenic Acid GLA

- Consistently shown improvement in markers of inflammation/inflammatory mediators in dry eye
- Shown promise in other inflammatory diseases, like rheumatoid arthritis, IBD, dermatitis, and diabetic retinopathy
- In Sjögren’s increases tear production, raises PGE1 in tears (Frageo, 2018)
- Supports meibomian glands (Davis, 2007)
- Probably through anti-inflammatory action
- 2,000-3,000 mg omega-3 is usually required to have significant effect
- In contrast, 2.15 mg of GLA significantly reduced 2 different inflammatory markers (HLA-DR, CD11c) in the HydroEye trial (Sheppard, Pflugfelder, Whitley et al. Cornea, 2013)

Is GLA offered in the triglyceride (TG) form? aka “re-esterified”

- These forms of omega triglyceride (TG) vs ethyl ester (EE) mainly apply only to fish oils
- Fish oil when it’s purified is transformed from the natural TG form in fish to the EE form
- Which allows the omegas to be concentrated & purified
- Fish oil companies have heavily marketed re-esterified or TG fish oils as vastly more absorbable and bioavailable
- GLA only comes as TG form
- No other forms
- TG vs EE discussion is purely about different fish oils

Pick the right nutraceutical not “fish oil” ad get:

- Improvement in irritation symptoms
- Better cornea smoothness
- Significantly lower levels of inflammatory markers

Regenerative Healing

Amniotic Membrane

Prokera

Amniotic Membrane

- To help reset the eye from a stage 3-4 back to something manageable
- Failure on multiple therapies
- Sjögren’s and the rheumatological patient
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Dry Eye and Amniotic Membrane

Neurostimulation

What has changed?
What is new?
Is it better you decide

Ocular Surface Disease/Dry Eye

Aqueous production

- True Tear Allergan
- FDA approved (April 25, 2017)
- New development for treatment of ocular surface disease
- Intranasal Tear Neurostimulator
- Uses mild electric pulse to stimulate branch of trigeminal nerve
- Research showing stimulates all 3 layers of the tear film
- Disposable end caps need to be replaced daily
- Sold by docs and/or Allergan and tips prescribed by optometrist

In-Office Lab Testing

What has changed?
What is new?
Is it better you decide

In-Office Lab Testing

Helps with:
- Switching patient to dailies
- Starting nutraceuticals
- Starting pharmaceuticals
- Following patients over time

TearLab Osmolarity Test

- Increased Tear Neurostimulation
- Disposable end caps need to be replaced daily
- Sold by docs and/or Allergan and tips prescribed by optometrist
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TearLab Osmolarity Test

- $300 and above
  - Helps confirm dry eye
- Asymmetry
  - Helps confirm unstable tear film

TearLab Discovery™ Assay Platform

- Panel Testing of Tear Fluid Biomarkers
  - Tear Osmolarity plus inflammatory marker
  - Capable of quantitative measurement
  - Single 100 nanoliter tear collection.
- Fluorescent Immunoassay
  - Rapid < 2 minutes from collection to result
- Study Panel: DED + Inflammation
  - Osmolarity
  - MMP-9

TearLab Discovery™ Platform Timing

- 510(k) submission in January 2017
- Expected approval in 2019

Traditional Lateral Flow Tests Highly Volume Dependent

Traditional lateral flow assays need to collect upwards of \(10 \mu L\) of sample which is not generally feasible to sample in clinical practice. In DED patients, much less than \(1 \mu L\) is readily available without reflex tearing.

\[1 \mu L \approx 40 \text{ ng/mL}\]

\[500 \text{ ng/mL}\]

TearLab Discovery™ requires about 100 nL, 1/100th of the volume required by traditional tests.

*TearLab data on file

TearLab Discovery™ Compares Well to InflammaDry®

Despite using 1/100th the volume of tear fluid, TearLab Discovery shows good agreement with the InflammaDry® method.

\[\text{TearLab} = 0.1 \mu L\]

\[\text{InflammaDry} = 10.0 \mu L\]

*TearLab data on file
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InflammaDry®

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InflammaDry®
For inflammatory dry eye detection
Normal levels of MMP-9 in human tears ranges from 3-41 ng/ml

NEGATIVE TEST RESULT
MMP-9 < 40 ng/ml

POSITIVE TEST RESULT
MMP-9 ≥ 40 ng/ml

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InflammaDry

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Sjö Diagnostic Test

Uses proprietary biomarkers to create an advanced diagnostic panel
Early detection of Sjögren’s syndrome in your patients

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Innovations Outside of Dry Eye

Pharma Update Glaucoma

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Xelpros™ (latanoprost ophthalmic solution 0.005%)

- Sun Pharmaceuticals
- Approved September 2018
- Dosage: QD
- Reduce IOP in open-angle glaucoma and ocular hypertension
- Xelpros is the first latanoprost product NOT formulated with the preservative benzalkonium chloride
  - Potassium sorbate 0.47% - preservative
- Reduces IOP in patients with open-angle glaucoma and ocular hypertension
  - Up to a mean of 6 mm Hg to 8 mm Hg in randomized clinical trials
Xelpros™ (latanoprost ophthalmic solution 0.005%)

- Not available in pharmacies
- A direct pay between patient and partnering pharmacies
  - Captain Pharmacy
  - Transition Pharmacy
- Xelpros Xpress offers:
  - No need for authorizations
  - No coupon activation
  - Prompt refillment and refills
  - $55 for 30 days, $110 for 90 days

Rhopressa™ 0.02% (netarsudil ophthalmic solution)

- Aerie Pharmaceuticals
- Approved December 2017
- Treatment of glaucoma or ocular hypertension
- Rho kinase inhibitor
  - ROCK- NET Inhibitor
- Once daily in the evening
  - Twice a day dosing is not well tolerated and is not recommended

Side Effects
- Conjunctival hyperemia
- Conjunctival hemorrhage

Rhopressa (ROCK-NET Inhibitor) Triple-Action

3 Identified IOP-Lowering Mechanisms
- ROCK inhibition relaxes TM; increases outflow
- NET inhibition reduces fluid production
- ROCK inhibition lowers Episcleral Venous Pressure (EVP)

Netarsudil is Similarly Effective at Baseline IOPs

- <25 mmHg and ≥25 mmHg
- Pooled Analysis: Rocket 1, Rocket 2, Rocket 4

Day 90: Change from Baseline IOP by Baseline Subgroup (Means)

- No clinically relevant effects on vital signs
- No labeled contraindications for Rhopressa™
- No clinically relevant effects on vital signs
  - Blood Pressure
  - Changes were generally small and not clinically relevant in both groups
  - Heart Rate
  - Twice caused statistically significant reductions in the phase 3 studies by an average of 2-3 beats per minute
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Adverse Events

<table>
<thead>
<tr>
<th></th>
<th>Netarsudil 0.02% QD (N=839)</th>
<th>Timolol 0.5% BID (N=839)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n (n%)</strong></td>
<td>144 (17.2)</td>
<td>15 (1.8)</td>
</tr>
<tr>
<td>TEAE Conjunctival Hemorrhage</td>
<td>8 (1.0)</td>
<td>0</td>
</tr>
</tbody>
</table>

Conjunctival Hemorrhage was Sporadic and Severity did not Increase with Continued Dosing

Majority 92.4% (133/144) of the conjunctival hemorrhage in netarsudil QD group was mild, 6.3% (9/144) was moderate and 1.4% (2/144) was severe. Self-resolution with continued dosing.

Images were taken from netarsudil subjects

Source: Courtesy of study investigators AR-13324-CS301, AR-13324-CS302

Cornea Verticillata Due to Phospholipidosis

Medications known to cause verticillata: amiodarone, chloroquine, naproxen, phenothiazine, oculcar gentamicin and tobramycin

Due to phospholipidosis where the parent drug is complexed with phospholipids in the lysosomes.

Literature review suggested it is an adaptive response by the body rather than an adverse pathology

Data on File Based on AR-13324-IPH07


Medications known to cause verticillata: amiodarone, chloroquine, naproxen, phenothiazine, ocular gentamicin and tobramycin

Phospholipid accumulation

Control

Amiodarone

Netarsudil

Cornea Verticillata Observed in Phase 3 Studies

- Cornea verticillata refers to a whorl-like pattern of deposits typically localized to the basal corneal epithelium.
- Subjects are asymptomatic.
- The onset was ~6 to 13 weeks (netarsudil QD).

Images were taken from netarsudil subjects

Source: Courtesy of study investigators AR-13324-CS302

Rocklatan™

Approved March 14, 2019
- Aerie pharmaceuticals
- Once-daily eye drop
- First PGA combination in USA
- Passes superiority testing

Bimatoprost SR

Sustained Release

- Allergan
- Phase 3 Clinical Trial Update
  - 20 month efficacy and safety study
  - 528 people with POAG or Ocular HTN
  - 39% reduced IOP over 12 years primary efficacy period
  - Met predefined criteria for noninferiority to the comparator
  - Sustained
- Designed to lower IOP for 4 months
- Well tolerated to this point
- New drug application most likely second half of 2019

Innovation

Neurotrophic Keratitis

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Oxervate™ (cenegermin-bkbj)

- Approved 2018
- Ophthalmic solution indicated for the treatment of neurotrophic keratitis
- Dosing: Instil 1 drop in affected eye 6 times per day (at 2 hour intervals) for 8 weeks
- Storage issues: In the fridge - once “actively ready” for use, then it is only stable for 12 hours
- ADRs: eye pain, inflammation, corneal deposits

Lotemax SM 0.38%

Innovations

Loteprednol etabonate
Lotemax

Innovations

Glucoma
Minimally Invasive Glaucoma Surgery
MIGS

The iStent inject Trabecular Micro-bypass

- For patients with cataracts and glaucoma, iStent inject is:
- FDA approved therapy for the treatment of elevated IOP in adult patients with mild-to-moderate primary open-angle glaucoma in conjunction with cataract surgery
- The first available, all internal, micro-bypass system designed to restore natural physiological outflow through two openings through the trabecular meshwork

iStent

iStent inject creates two patent bypass pathways through the trabecular meshwork
Resulting in multi-directional flow through Schlemm’s canal
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Healthy Choriocapillaris, Bruch’s, RPE, and Photoreceptors

Cholesterol Barrier Deposited Along Bruch’s and RPE

RPE Secretes Even More Cholesterol and Degenerates

Visibly Evident Drusen on Fundus Evaluation

Disease Process of AMD Starts Below the Surface
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Same Disease at Every Stage
AMD is all one disease, no matter the stage

Subclinical AMD
Early AMD
Intermediate AMD

Impaired Dark Adaptation Is Earliest Biomarker of AMD

ALSTAR Study
Prospective Study of Subclinical AMD
• Sample consisted of 325 adults with clinically detectable AMD
• At baseline, 24% of the subjects exhibited impaired dark adaptation
• AMD status determined at 3-year follow-up visit

This Leads to a More Comprehensive AMD Classification System:
Structure + Function

<table>
<thead>
<tr>
<th>Severity</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>No AMD</td>
<td>No drusen or small drusen ≤ 63 µm and no AMD pigmentary abnormalities</td>
</tr>
<tr>
<td>Subclinical</td>
<td>No drusen or small drusen ≤ 63 µm and no AMD pigmentary abnormalities, impaired dark adaptation</td>
</tr>
<tr>
<td>Early AMD</td>
<td>Medium drusen &gt; 63 µm and ≤ 125 µm and no AMD pigmentary abnormalities</td>
</tr>
<tr>
<td>Intermediate AMD</td>
<td>1 large druse &gt; 125 µm and any AMD pigmentary abnormalities</td>
</tr>
<tr>
<td>Advanced AMD</td>
<td>2 large Geographic Atrophy and Neovascular AMD</td>
</tr>
</tbody>
</table>

Dark Adaptometry Validated in Multi-Site Study

High Sensitivity
Correctly identified 90.6% of confirmed AMD cases

High Specificity
Correctly identified 90.5% of confirmed normal cases

High Accuracy
90.6% overall

Dark Adaptometry in AMD Function Test
- AdaptDx was the first Automated Dark Adaptometer Available for Clinical Use
- Measures how long to recover from bright light to darkness
- Reduces test time
- Functional test that can help overcome the challenges in diagnosing AMD
- Alabama Study on Early Age-Related Degeneration (ALSTAR)
  • Able to detect subclinical 3 years before clinically visible
  • 92% dark adaptation abnormal AMD
  • Early detection happens in earlier stages of AMD
- Early detection before visual acuity
  • AdaptDx 23/04
  • Sensitivity: 92%
  • Specificity: 85%
This Means We Now Have an Early Symptom We Can Use to Help Diagnose AMD

- Night vision impacted in early AMD: 30+ studies
- AMD patients often give up driving at night
- Night vision is impaired before day vision
- Typically ECP’s chalk this complaint up to cataracts

Ask Every Patient Over 50 About Their Night Vision

Sita Faster

- Turns off False Negatives
- Turns off Blind Spot monitor
- Leaves on False Positives
- Leaves on Gaze Tracking
- Faster test with same reliability

Opportunities for Improvement in Central 10 Degrees

Glaucomatous damage of the macula is common and can occur early in the disease.
- Can be missed or underestimated or both, with standard 24-2 VF tests that use a 6° grid

24-2 and 10-2 VF Examples:
- Blue cross region on the 24-2 VF = central 10-2 VF
- red cross = abnormal
- Op 24-2 VF normal 10-2 VF abnormal
- OD 24-2 VF abnormal 10-2 VF normal
The expert group selected specific 10-2 test points:

- Prevalence and depth of glaucomatous macular defects were systematically evaluated for select optimum test points;
- Patterns were chosen to be accessible to glaucomatous defects both from structural and functional studies.

The expert group: Donald C. Hood, Stuart K. Gardiner, Allison M. McKendrick, and William H. Swanson.

Selected test locations are shown in red boxes.

The 24-2C test pattern combines all 24-2 points + ten selected 10-2 points (shown in OD orientation).

SITA Faster 24-2C showed enhanced sensitivity to detect visual field loss in Central 10 degrees.

SITA Faster 24-2C showed an enhanced sensitivity to detect visual field loss in the central 10 degrees over the SITA Fast 24-2 pattern.

- Increased total and pattern deviation flagging of the ten additional SITA Faster 24-2C points corresponded to the flagging of the same points tested on the SITA Fast 10-2 test.

Minimize Time and Maximize Information with HFA3

- SITA Faster 24-2:
  - Test in 3 minutes or less
  - ~50% faster than SITA Standard; ~30% faster than SITA Fast
- SITA Faster 24-2C:
  - More information in the central field
  - ~20% faster than SITA Fast 24-2

Mixed SITA GPA

- Clinical equivalence of tests allows intermixing SITA Faster, Fast, Standard, 24-2, 30-2, and 24-2C in progression analysis
- Add new tests to patient progression
- Helps immediately adopt SITA Faster
What is it?

- The Icare® HOME tonometer
  - Handheld
  - Battery operated device
  - Without the need for topical anesthetic
- Intended as an adjunct for monitoring IOP of adult patients (self-use)
- Caregivers in cases where the patient is not able to obtain their own measurements

Intended as an adjunct for monitoring IOP of adult patients (self-use)

Caregivers in cases where the patient is not able to obtain their own measurements

Technology

Light weight (26.5 mg) probe touches the cornea with low speed (0.25-0.30 m/s)

Main Signal Characteristics

- Time (sample clock)
- Speed (ADC units)

Contact with cornea

Probe speed is zero, rebound starts

Light weight probe

Low probe speed

Minimal energy

Icare® HOME tonometer

- IOP, date, time, eye recognition (right/left) and measurement quality are all stored in the internal memory.
- Data is transferred to a PC for further analysis by the prescribing physician.
- New features: positioning light, automatic eye recognition system, series or single measurements, new user interface panel.

Icare EyeSmart: Automatic Eye Recognition

The tonometer includes an automatic eye recognition system that identifies which eye is being measured.

- Two infrared LED transmitters below probe (1)
- One infrared LED sensor above probe (2)

The infrared light is reflected from nose back to the sensor

The sensor knows from which transmitter the reflected infrared light came from and thus which eye, right or left, was measured

The resulting eye indication is stored into the memory of the tonometer

Rebound Tonometry is Safe

- No significant safety issues reported for the Icare® ic100 & TA01 tonometers with a large number sold worldwide (40,000) and in the United States (9,000)
  - In use by health care personnel with varying degrees of tonometer experience and some of which have little or no ophthalmic training.
- No significant safety issues reported for the Icare® HOME tonometer or its predecessor, Icare ONE; over 2,000 tonometers in use worldwide
  - Majority in Europe after Icare ONE received CE mark in late 2009 and low introduced in 2010.

Why 24 Hr Monitoring?

24 hour IOP monitoring can reveal higher peaks and wider fluctuations of IOP than those found during routine office visits. Research reports a steady daily increase in IOP in some patients being treated for glaucoma.

- Studies have shown IOP rises when a patient is supine. IOP peaks were measured upon awakening and declined within 30 minutes.
Innovations Instruments Wide Field

Monaco... provides more information faster

Monaco can capture color and optomap® images along with posterior pole OCT scans of both eyes in as little as 90 seconds.

This quick, comprehensive look inside the eye has been shown to enhance pathology detection and significantly improve clinic flow.

Clarus-Zeiss
Thank You and Hope You Enjoyed

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