February 24, 2020

R&D Day 2020

A New Paradigm for the Treatment of Immune-Mediated Diseases

Nasdaq: ALDX

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Value Proposition

Developing Next-Generation Medicines to Improve the Lives of Patients with Immune-Mediated Diseases

1. **DEEP AND INNOVATIVE PIPELINE**
   Focused on immune-mediated diseases
2. **NEAR-TERM DEVELOPMENT CATALYSTS**
   Late-stage trials in multiple indications
3. **SOLID TRACK RECORD**
   Topical ocular reproxalap studied in more than 1,100 patients
4. **SIGNIFICANT MARKET OPPORTUNITY**
   Lead ocular compounds target addressable market of >1B patients worldwide

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Three Late-Stage Ocular Programs Targeting Significant Unmet Needs

Dry Eye Disease

Current Rx options can require months to demonstrate even modest efficacy

Allergic Conjunctivitis

Unchecked growing disease burden and limited options beyond OTC/Rx antihistamines

Proliferative Vitreoretinopathy

No approved therapy

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Agenda

• Opening Remarks	Todd Brady, M.D., Ph.D., President and CEO
• Reproxalap in Dry Eye Disease	David Clark, M.D., Chief Medical Officer
• Reproxalap in Allergic Conjunctivitis	Dr. Clark
• Break	
• Ocular Surface Diseases – Allergic Conjunctivitis and Dry Eye Disease	Paul Karpecki, O.D., FAAO
• Allergic Conjunctivitis Market Opportunity	David McMullin, Chief Commercial Officer
• Proliferative Vitreoretinopathy & Concluding Remarks	Dr. Brady

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David Clark, M.D., Chief Medical Officer

Reproxalap in Dry Eye Disease

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Reproxalap Clinical Development in Dry Eye Disease

DRY EYE DISEASE

PHASE 2a – Efficacy/safety of two concentrations (0.1%, 0.5%)

51 patients	4 weeks	DED symptoms and signs

PHASE 2b – Efficacy/safety of two concentrations (0.1%, 0.25%) vs. vehicle

300 patients	12 weeks	DED symptoms and signs

Drop Experience – Reproxalap (0.25%) vs. Xiidra®

19 patients	1 hour post-dosing	Drop experience in DED patients

RENEW-Part 1 – Two-part adaptive Phase 3; Efficacy/safety (0.25%) vs. vehicle

422 patients	12 weeks	Constant vs. induction/ maintenance dosing*

Formulation PHASE 2 – Efficacy/safety of alternate (0.25%) formulation vs. vehicle

206 patients	12 weeks	Induction / maintenance dosing*

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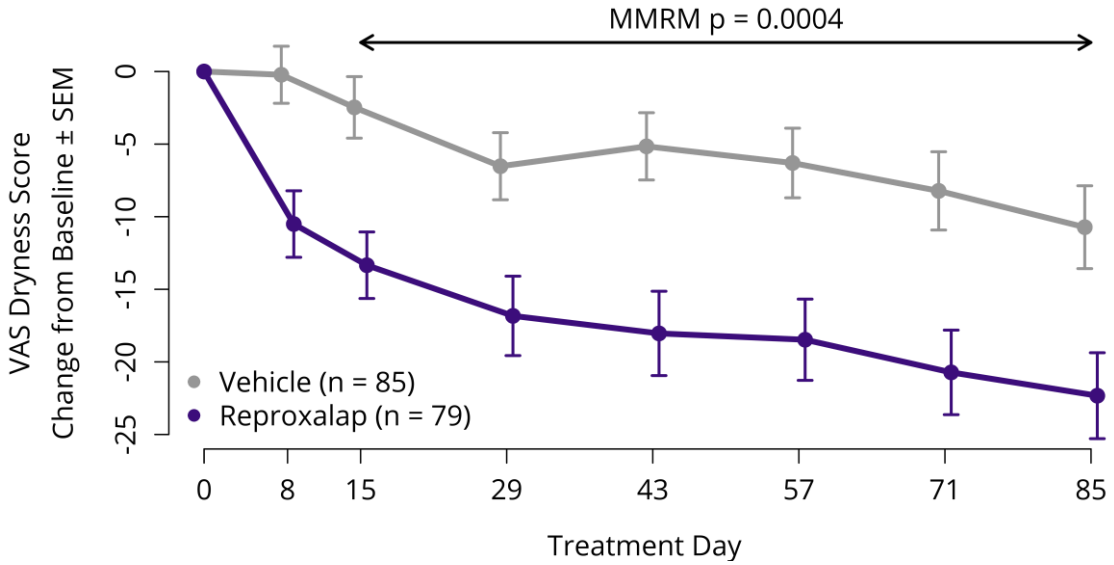
*Constant dosing = QID; Induction-Maintenance dosing = QID for Weeks 1-4 and BID for Weeks 5-12.

= Trial completed
DED = Dry Eye Disease

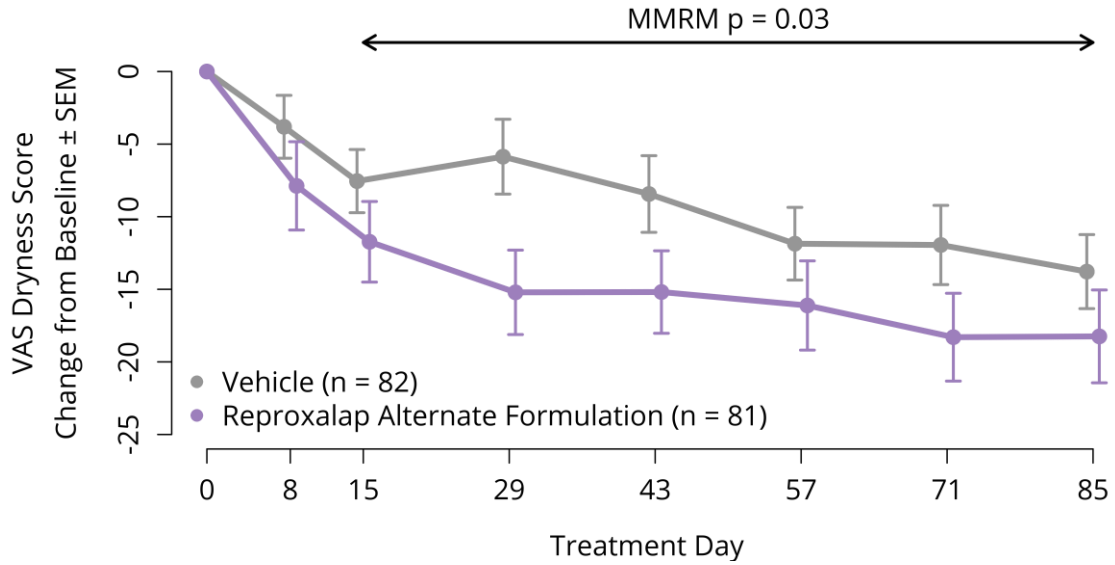
Reproxalap Met Dryness Symptom Primary Endpoint in RENEW-Part 1 and Formulation Phase 2 Clinical Trials

Ocular Dryness Score (VAS) Change From Baseline
Dryness (OD4SQ) Baseline Score ≥ 3

RENEW-Part 1
(Induction-Maintenance Dosing)



Formulation Phase 2
(Induction-Maintenance Dosing)



Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns; mild instillation site irritation is the most commonly reported adverse event in clinical trials.
Source: Reproxalap RENEW-Part 1 and Formulation Phase 2 DED clinical trial results.

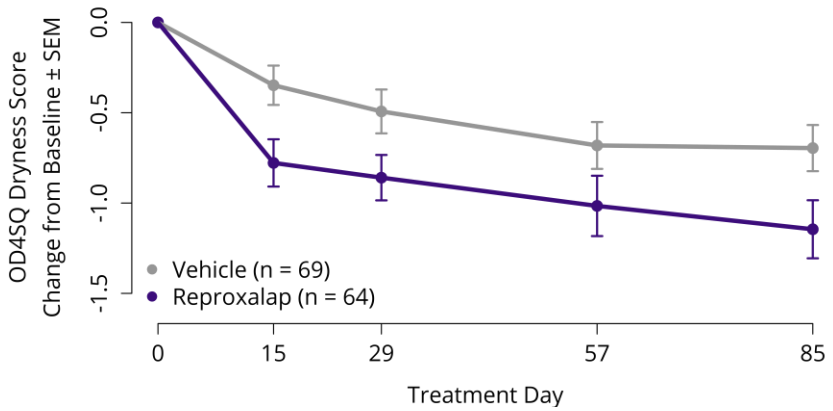
OD4SQ = Ocular Dryness 4-Symptom Questionnaire
VAS = Visual Analog Scale
MMRM = Mixed Effect Model Repeated Measures

Relief of Dryness Generally Consistent Across Phase 2b, Both Dosing Arms of RENEW-Part 1, and Formulation Phase 2 Clinical Trials

Ocular Dryness Score (OD4SQ) Change From Baseline
Dryness (OD4SQ) Baseline Score ≥ 3

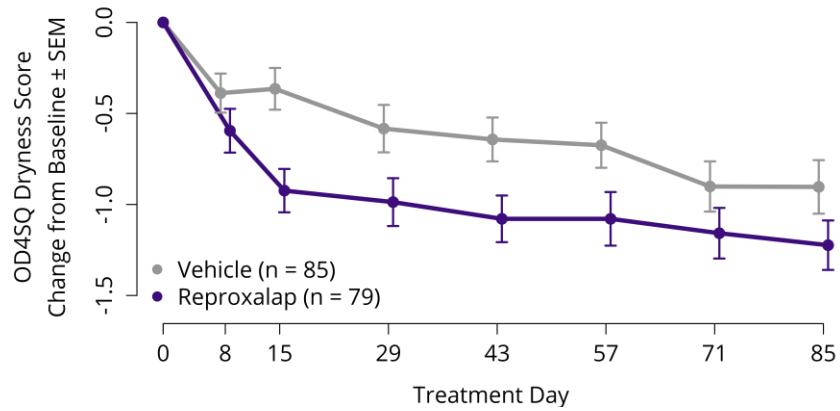
Constant Dosing

Phase 2b

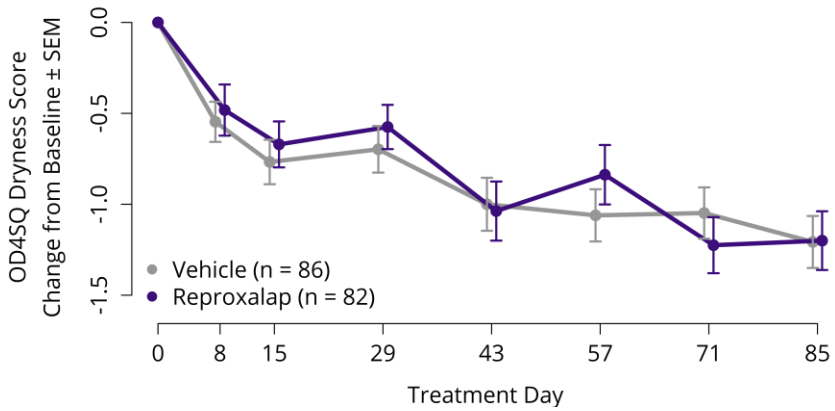


Induction-Maintenance Dosing

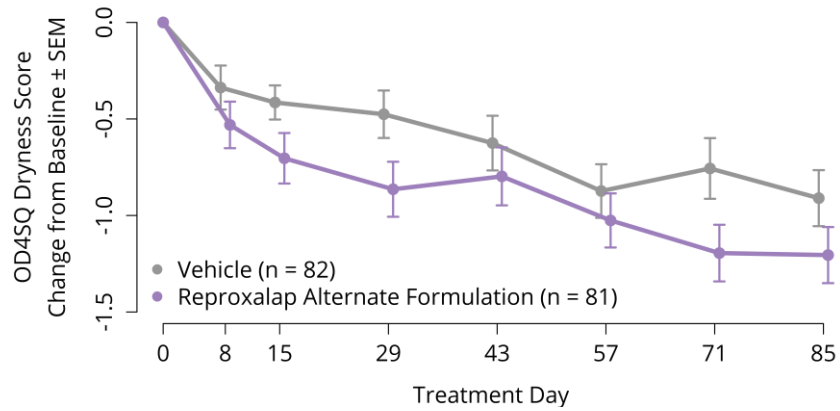
RENEW-Part 1



RENEW-Part 1



Formulation Phase 2



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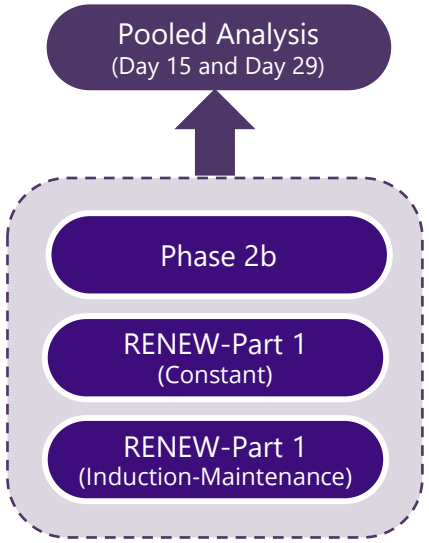
Source: Reproxalap RENEW-Part 1, Phase 2b DED, and Formulation Phase 2 DED clinical trial results.

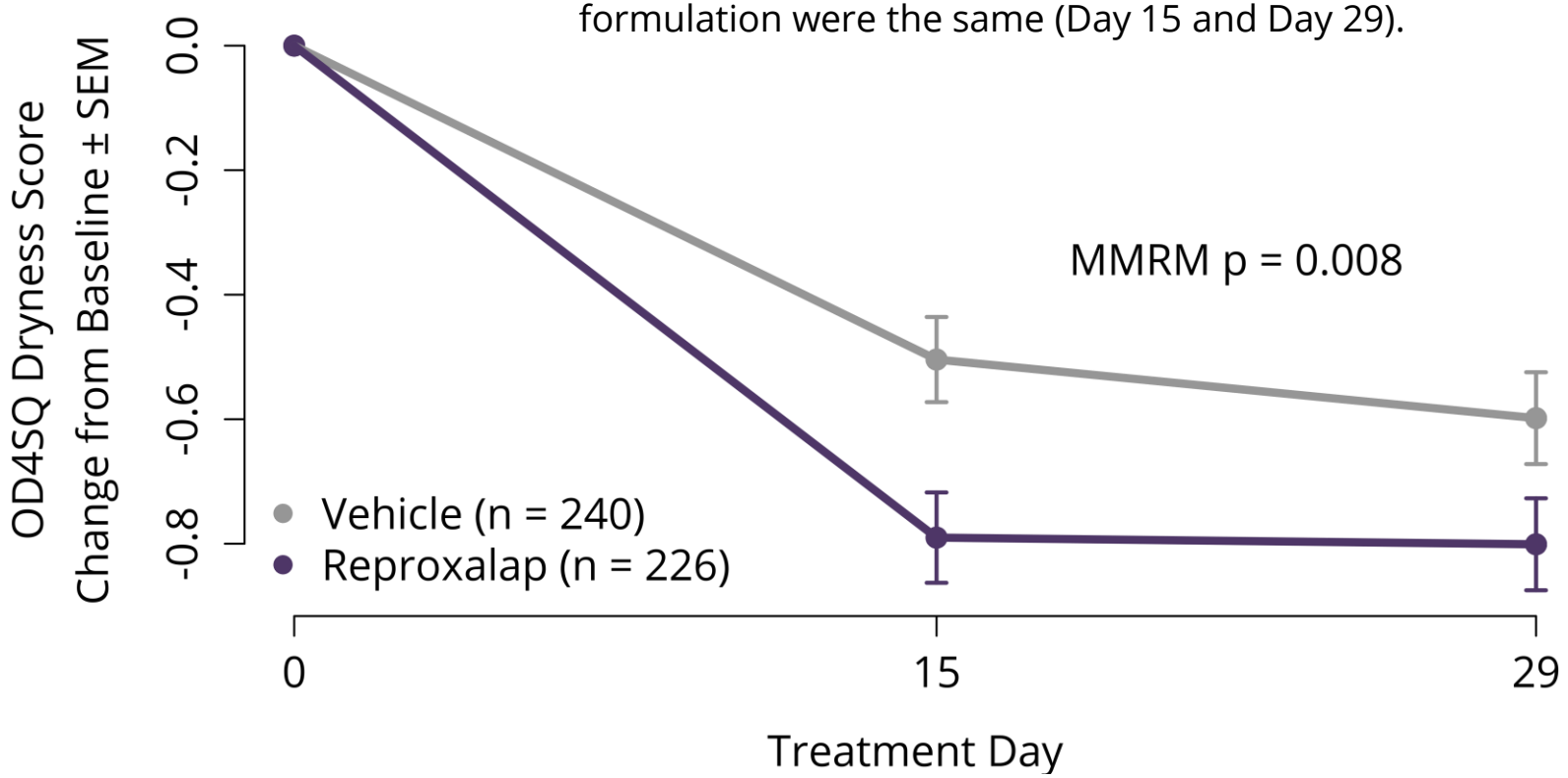
DED = Dry Eye Disease
OD4SQ = Ocular Dryness 4-Symptom Questionnaire

Combined Data from Both Treatment Arms of RENEW-Part 1 and Phase 2b Clinical Trials Suggest Rapid and Potent Symptom Control Relative to Vehicle

Ocular Dryness Score (OD4SQ) Change From Baseline
Baseline Score ≥ 3



- Mixed effect repeated measures analyzed over the two time points in common across both trials during which the dosing regimen and formulation were the same (Day 15 and Day 29).



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Source: Reproxalap RENEW-Part 1 and Phase 2b DED clinical trial results.

OD4SQ = Ocular Dryness 4-Symptom Questionnaire
MMRM = Mixed Effect Model Repeated Measures

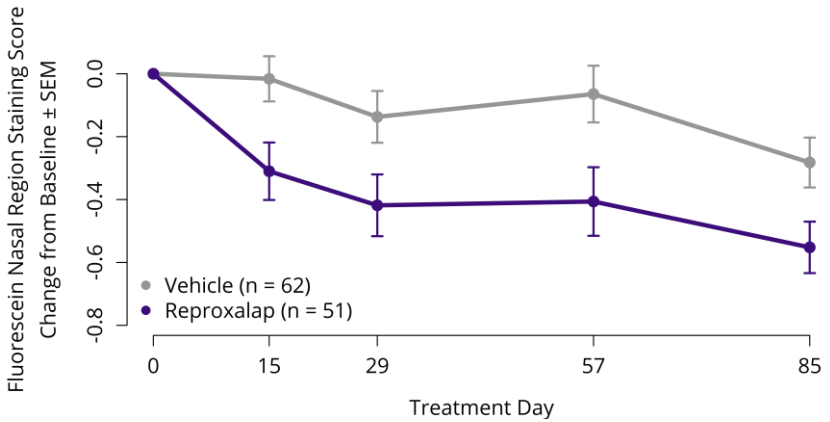
Staining Improvements Generally Consistent but Vehicle Effects Variable Across Phase 2b and Both Treatment Arms of RENEW-Part 1 Clinical Trials

Fluorescein Staining (Nasal Region) Change From Baseline
Baseline Score ≥ 2

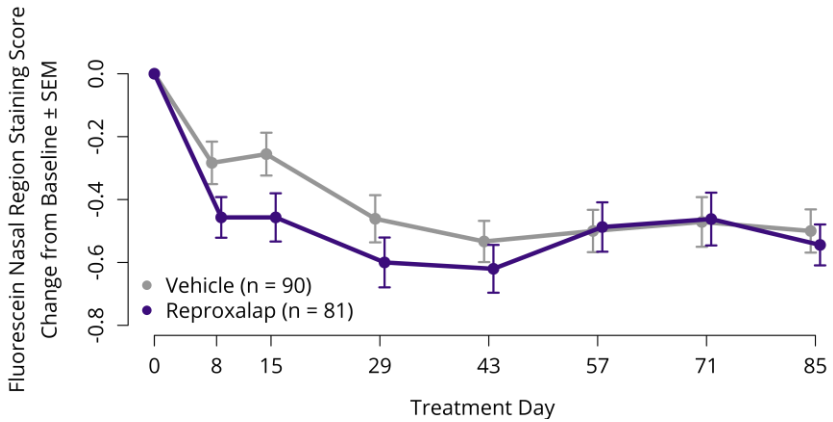
Constant Dosing

Induction-Maintenance Dosing

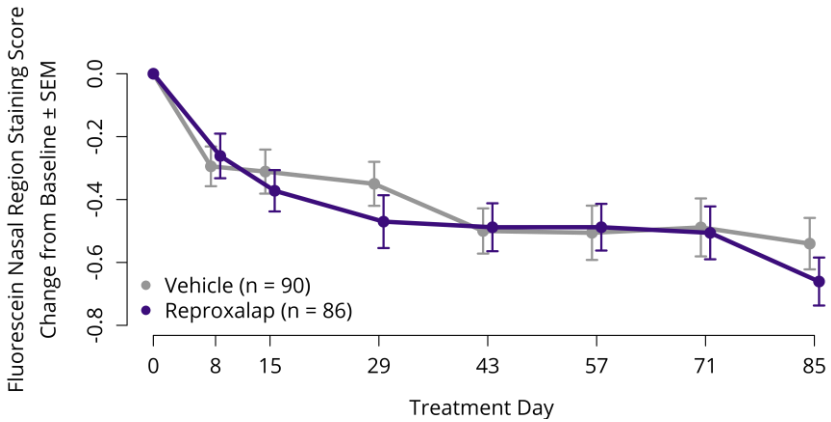
Phase 2b



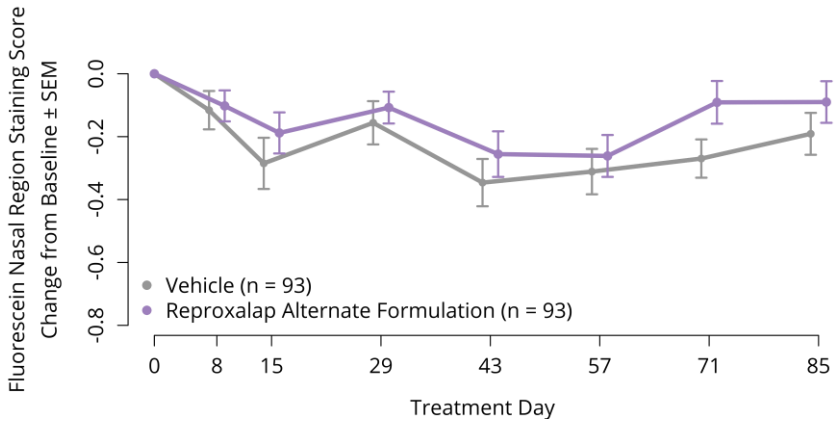
RENEW-Part 1*



RENEW-Part 1*



Formulation Phase 2*



*RENEW-Part 1 and Formulation Phase 2 clinical trials were impacted by a drug supply shortage for fluorescein eye stain, necessitating a mixed use of micro-pipetted liquid fluorescein and paper fluorescein strips (as back-up supply) for patient staining procedures.
Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns; mild instillation site irritation is the most commonly reported adverse event in clinical trials.
Source: Reproxalap RENEW-Part 1, Phase 2b DED, and Formulation Phase 2 DED clinical trial results.

DED = Dry Eye Disease

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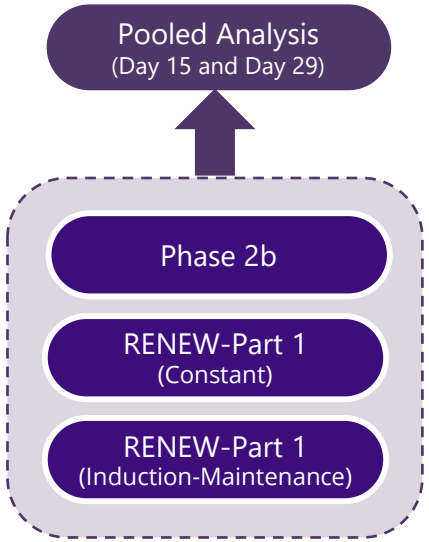
Baseline Score ≥ 2



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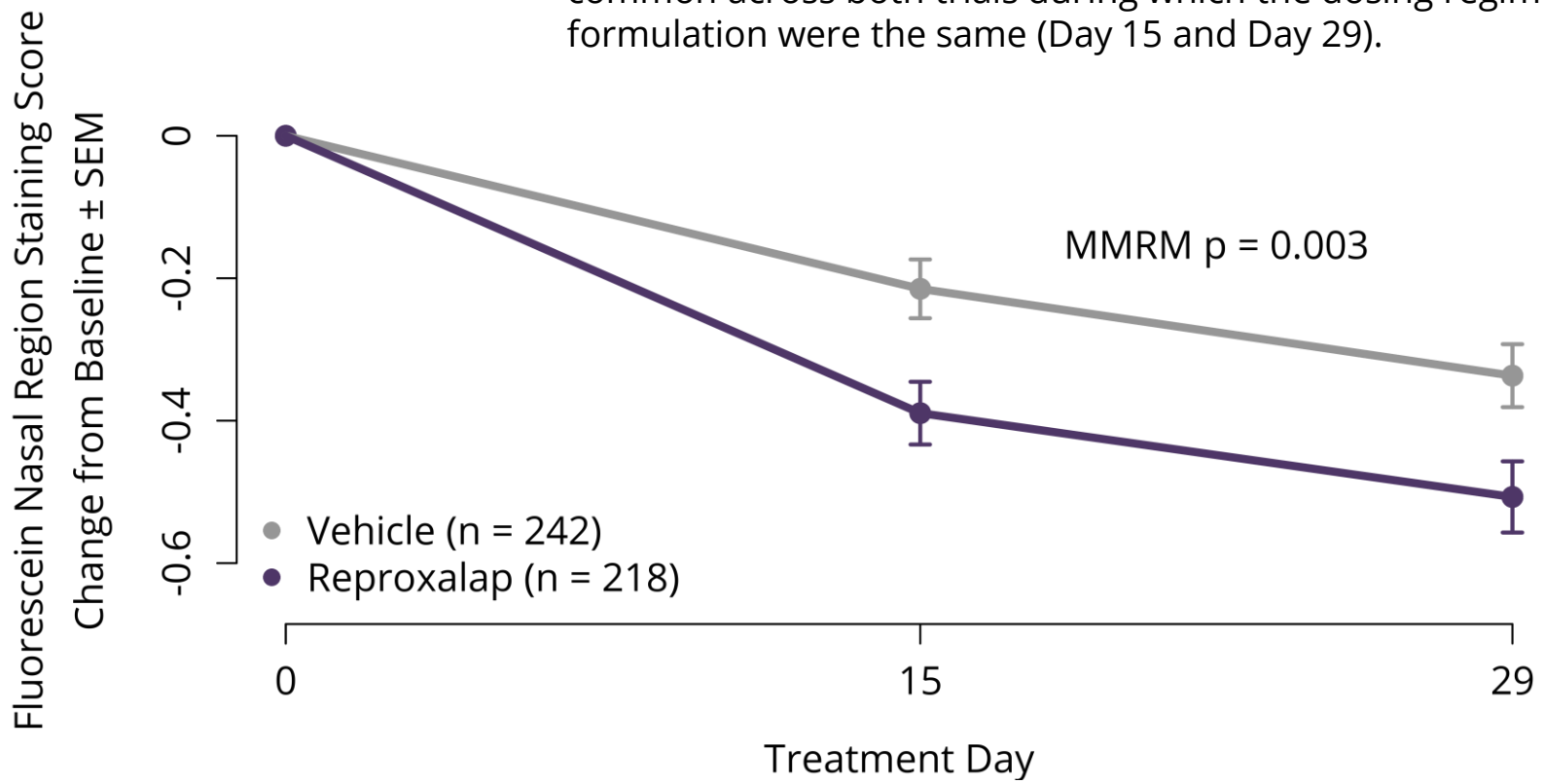

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Source: Reproxalap RENEW-Part 1 and Phase 2b DED clinical trial results.

MMRM = Mixed Effect Model Repeated Measures

Reproxalap in Dry Eye Disease

- Reproxalap has met the pre-specified symptom endpoint in RENEW-Part 1 and Formulation Phase 2 clinical trials.
- Pooled data suggest early and potent activity vs. vehicle in dryness and staining.
- Subsequent development plans are contingent on FDA feedback.

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David Clark, M.D., Chief Medical Officer

Reproxalap Drop Experience in Dry Eye Disease

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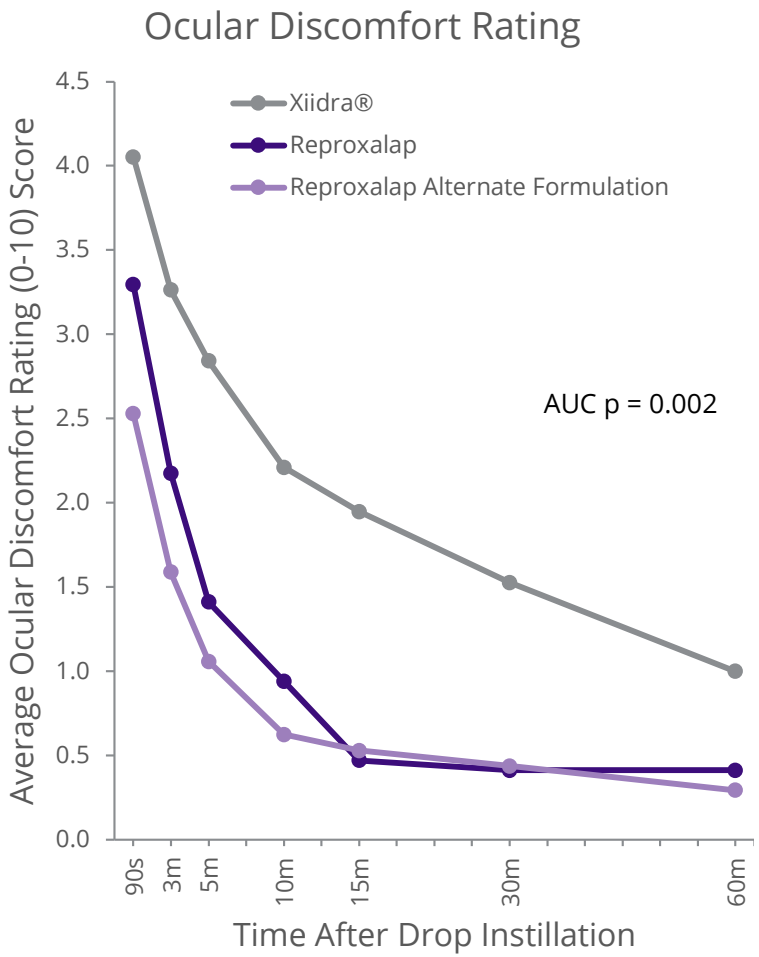
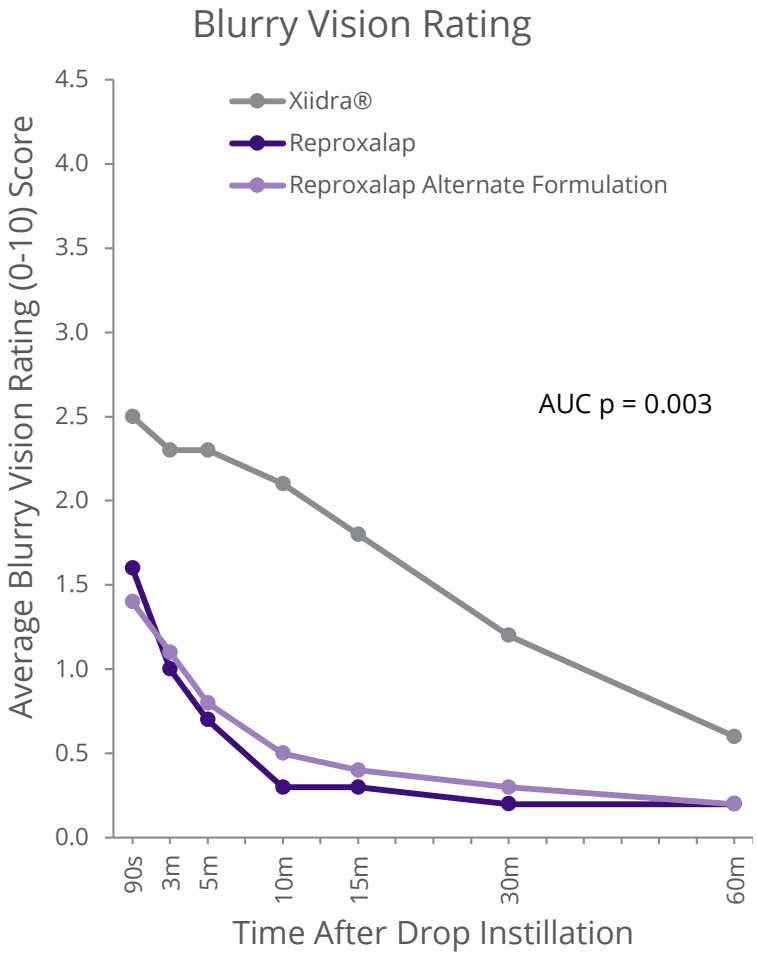
Eye Drop Experience Study Evaluated Xiidra® and Reproxalap Instillation Tolerability Head-to-Head

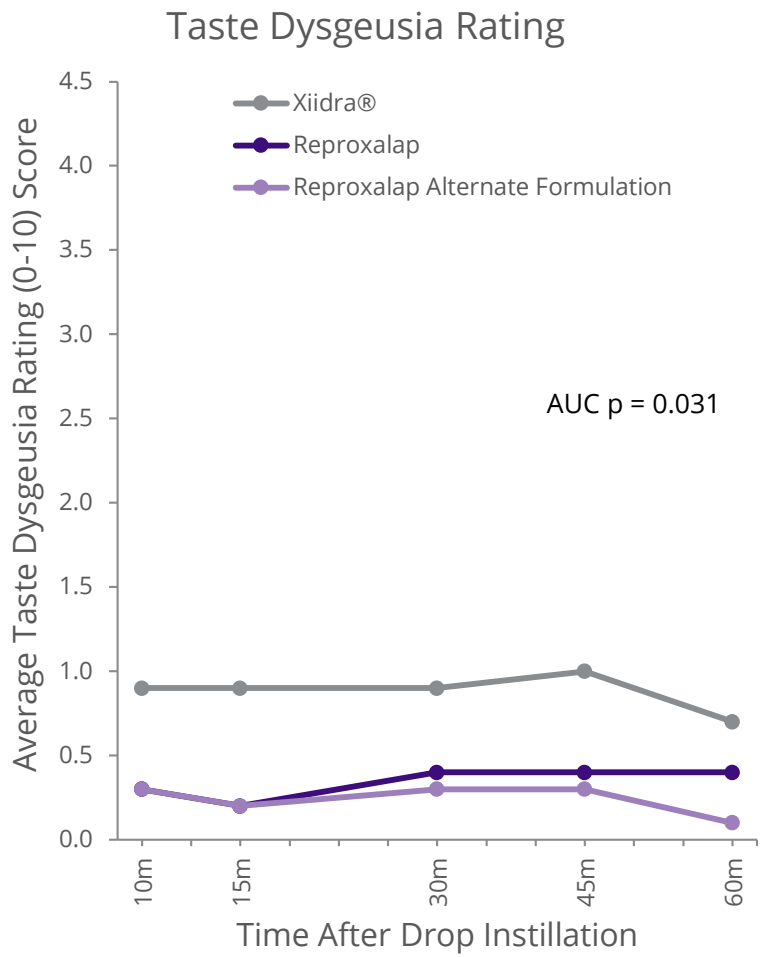
Conducted Q4 2019

- **Objective:**
  - Characterize the eye drop experience of reproxalap 0.25% compared to Xiidra®
- **Condition/Disease:**
  - Dry Eye Disease
- **Design:**
  - Three-Arm Crossover
  - Three visits over the course of one week
  - n = 19
- **Treatments:**
  - Reproxalap 0.25% (current formulation)
  - Reproxalap 0.25% (alternate formulation)
  - Xiidra® 5% (lifitegrast)
- **Exploratory Measures:**
  - Ocular Discomfort Rating (0-10):
    90s, 3m, 5m, 10m, 15m, 30m, 60m
  - Blurry Vision Rating (0-10):
    90s, 3m, 5m, 10m, 15m, 30m, 60m
  - Dysgeusia Rating (0-10):
    10m, 15m, 30m, 45m, 60m

Tolerability of Reproxalap Over One Hour Post-Instillation Significantly Improved vs. Xiidra® in Dry Eye Disease Patients







P-values represent MMRM of vehicle AUC vs. pooled Reproxalap AUC. Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials.
Source: Reproxalap vs. Xiidra® eye drop experience study results.

MMRM = Mixed Effect Model Repeated Measures
AUC = Area Under The Curve

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David Clark, M.D., Chief Medical Officer

Reproxalap in Dry Eye Disease Q&A

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Reproxalap in Allergic Conjunctivitis

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Reproxalap Clinical Development in Allergic Conjunctivitis

ALLERGIC CONJUNCTIVITIS

Conjunctival Allergen Challenge

PHASE 2a – Efficacy/safety (0.5%) vs. vehicle

100 patients	30 minutes post CAC	AC symptoms and signs

PHASE 2b – Efficacy/safety of two concentrations (0.1%, 0.5%) vs. vehicle

154 patients	60 minutes post CAC	AC symptoms and signs

ALLEVIATE – Phase 3 Efficacy/safety of two concentrations (0.25%, 0.5%) vs. vehicle

318 patients	60 minutes post CAC	AC symptoms and signs

Allergen Field Study

Allergen Field Study – Efficacy/safety of two conc. (0.25%, 0.5%) vs. vehicle

52 patients	4 weeks	Field model methods development

Allergen Chamber

Allergen Chamber – Efficacy/safety of two conc. (0.25%, 0.5%) vs. vehicle

66 patients	3.5 hours in chamber	Chamber model methods development

INVIGORATE – ONGOING Phase 3; Efficacy/safety of reproxalap 0.25% vs. vehicle

126 estimated enrollment	3.5 hours in chamber	AC symptoms and signs

CURRENTLY ONGOING

= Trial completed
AC = Allergic Conjunctivitis

Reproxalap Demonstrated Drug Effect Across Three Unique Clinical Models of Allergic Conjunctivitis

Allergen Field Study

Patients administer drug at home during allergy season and maintain a journal.

- ✓ Real-world exposure to allergen
- ✓ Repeated exposure to allergen throughout study
- × Uncontrolled allergen content and concentration
- × Variable participant behavior

Reproxalap drug effect demonstrated

Conjunctival Allergen Challenge

Investigator administers one drop of allergen mixture on to conjunctiva and records results.

- ✓ Specified allergen content and concentration
- ✓ Participants observed and assisted by investigator
- × Artificial allergen exposure
- × Single exposure limitation

Reproxalap drug effect demonstrated

Allergen Chamber

Investigator monitors and assists patients in a controlled allergen chamber.

- ✓ Real-world exposure to allergen
- ✓ Specified allergen content and concentration
- ✓ Repeated exposure to allergen throughout study
- ✓ Participants observed and assisted by investigator
- ✓ Assessment of prophylaxis and treatment

Reproxalap drug effect demonstrated

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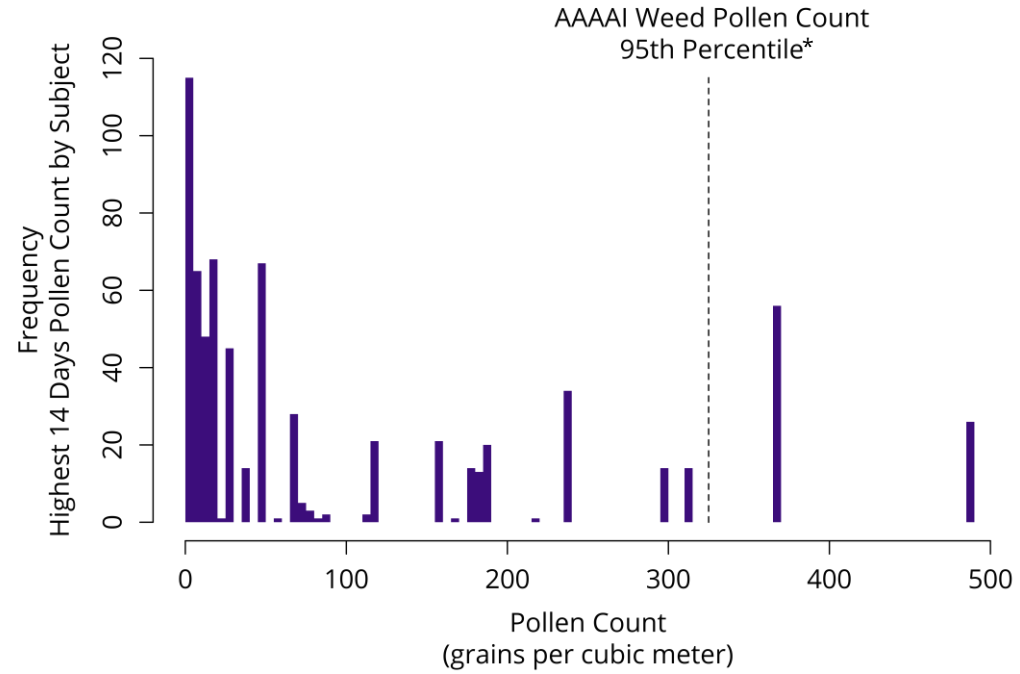
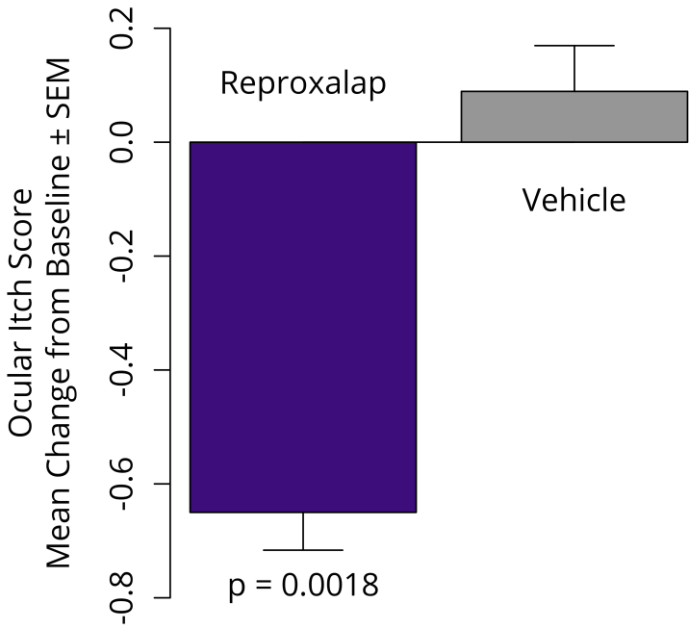
Field Study Illustrated Pollen-Variation Limitation of Clinical Model: Reproxalap Demonstrated Allergic Itch Reduction on Highest Pollen Days

Allergen Field Study

Histogram of Pollen Exposure During Field Study



Ocular Itch (0-4) Change from Baseline on Highest Pollen Days*



Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials.

*Highest Pollen Days defined as days with pollen counts at or above the 95th percentile of the American Academy of Allergy, Asthma & Immunology (AAAAI) Weed Pollen scale.

Source: Reproxalap allergen Field Study Phase 1/2 clinical trial results; Ocular itch scale 0 (no itch) to 4 (incapacitating itch).

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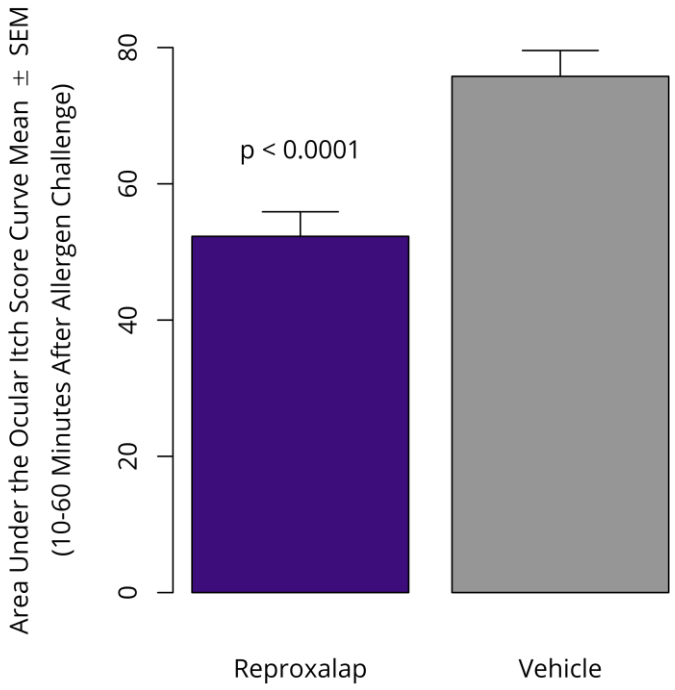
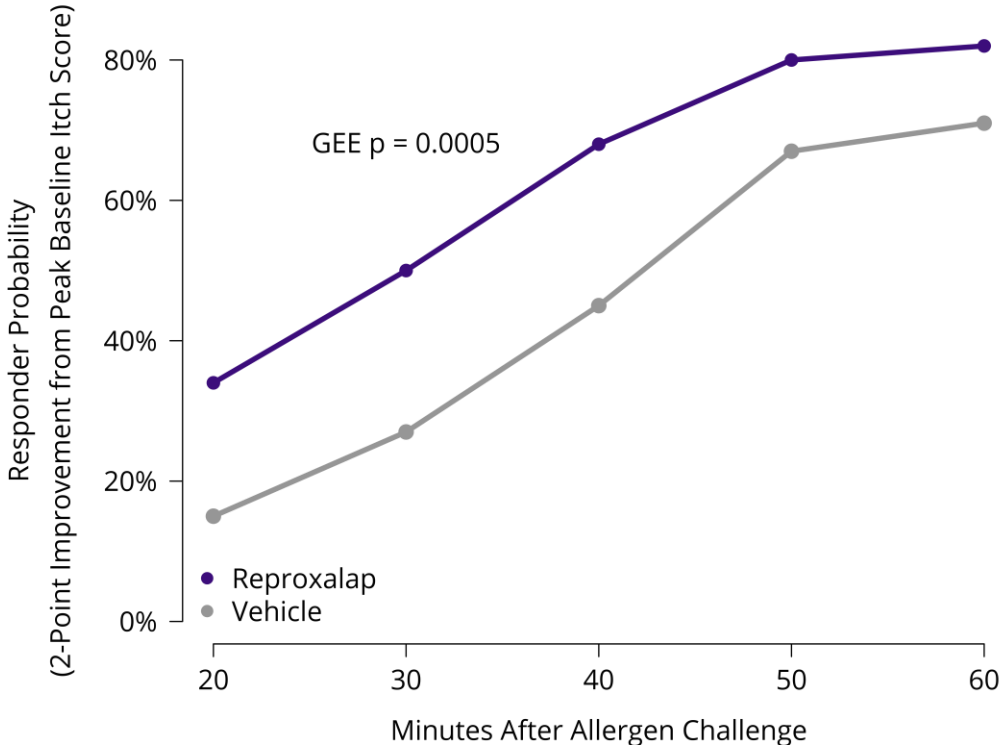
Reproxalap Demonstrated Durable Allergic Itch Reduction in Phase 3 Conjunctival Allergen Challenge Clinical Trial

Conjunctival Allergen Challenge

Total Ocular Itch Score (Area Under the Curve): 10 to 60 Minutes After Conjunctival Allergen Challenge



Probability of Two-Point Response - Ocular Itching Score: 20 to 60 Minutes After Conjunctival Allergen Challenge



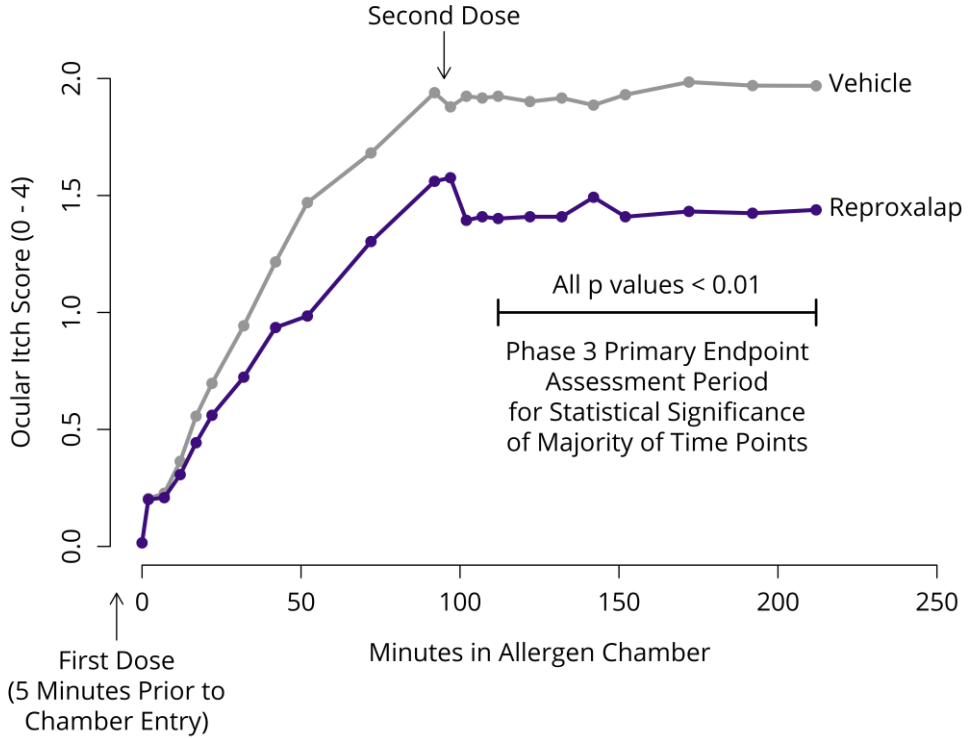
Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials.
Source: Reproxalap ALLEVIATE Phase 3 clinical trial results; Ocular itch scale 0 (no itch) to 4 (incapacitating itch).

SEM = Standard error of the mean
GEE = Generalized estimating equation analysis

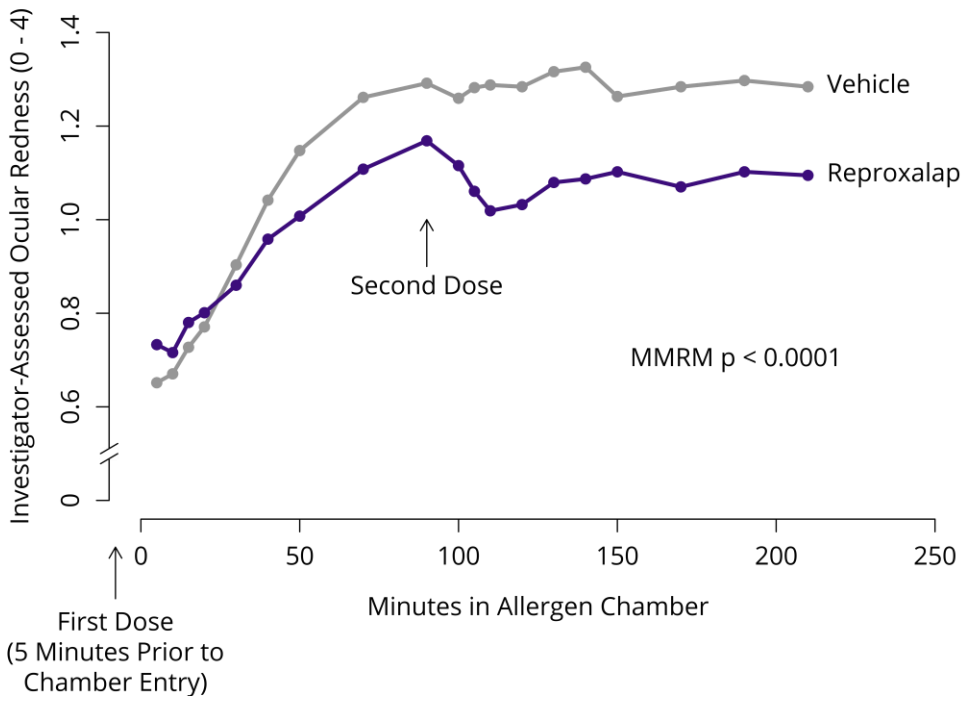
Reproxalap Demonstrated Durable Allergic Ocular Itch and Redness Reduction in Allergen Chamber Clinical Model

Allergen Chamber

Ocular Itching Score:
During 3.5 Hours of Allergen Exposure



Ocular Redness Score:
During 3.5 Hours of Allergen Exposure



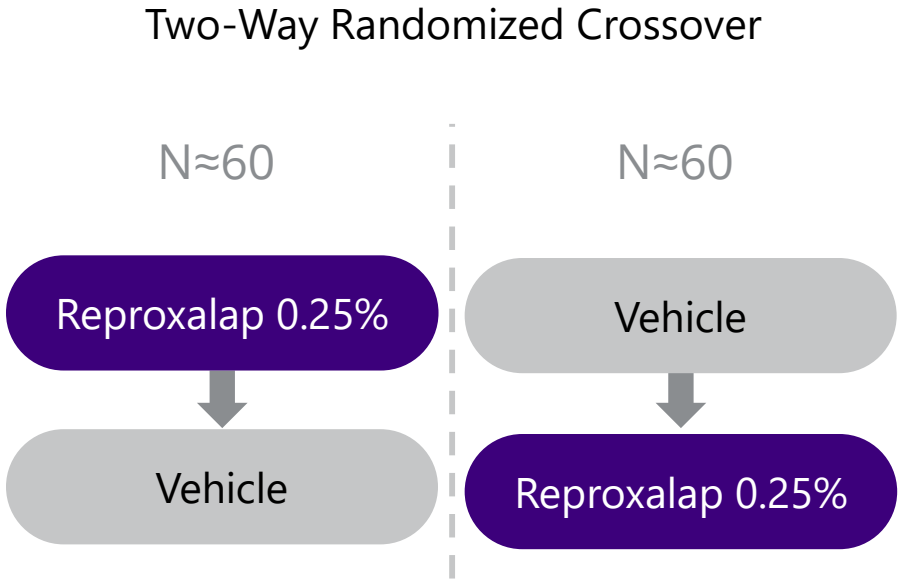
Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials.

Source: Reproxalap allergen Chamber Phase 1/2 clinical trial results; Ocular itch scale 0 (no itch) to 4 (incapacitating itch); Ocular redness scale (0-4).

MMRM = Mixed Effect Model Repeated Measures

The INVIGORATE Phase 3 Clinical Trial Design

- **Primary endpoint:**
  - Statistical significance in ocular itch (0-4 scale) at a majority of eleven time points between 110 and 210 minutes
- **Secondary endpoints:**
  - Investigator-assessed ocular redness score
  - Patient-reported ocular tearing score
  - Total ocular symptom score
- **Inclusion/exclusion criteria:**
  - History of moderate to severe allergic conjunctivitis to ragweed pollen
  - Itching score of ≥ 2.5 or redness score ≥ 2 in baseline chamber test
- **Chamber exposure and dosing schedule:**
  - 3.5 hours continuous allergen exposure
  - First dose 5 minutes before chamber entry
  - Second dose 90 minutes after entry (when non-treated patients reach peak allergy symptoms)



Results Expected H2 2020

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ClinicalTrials.gov Identifier: NCT04207736

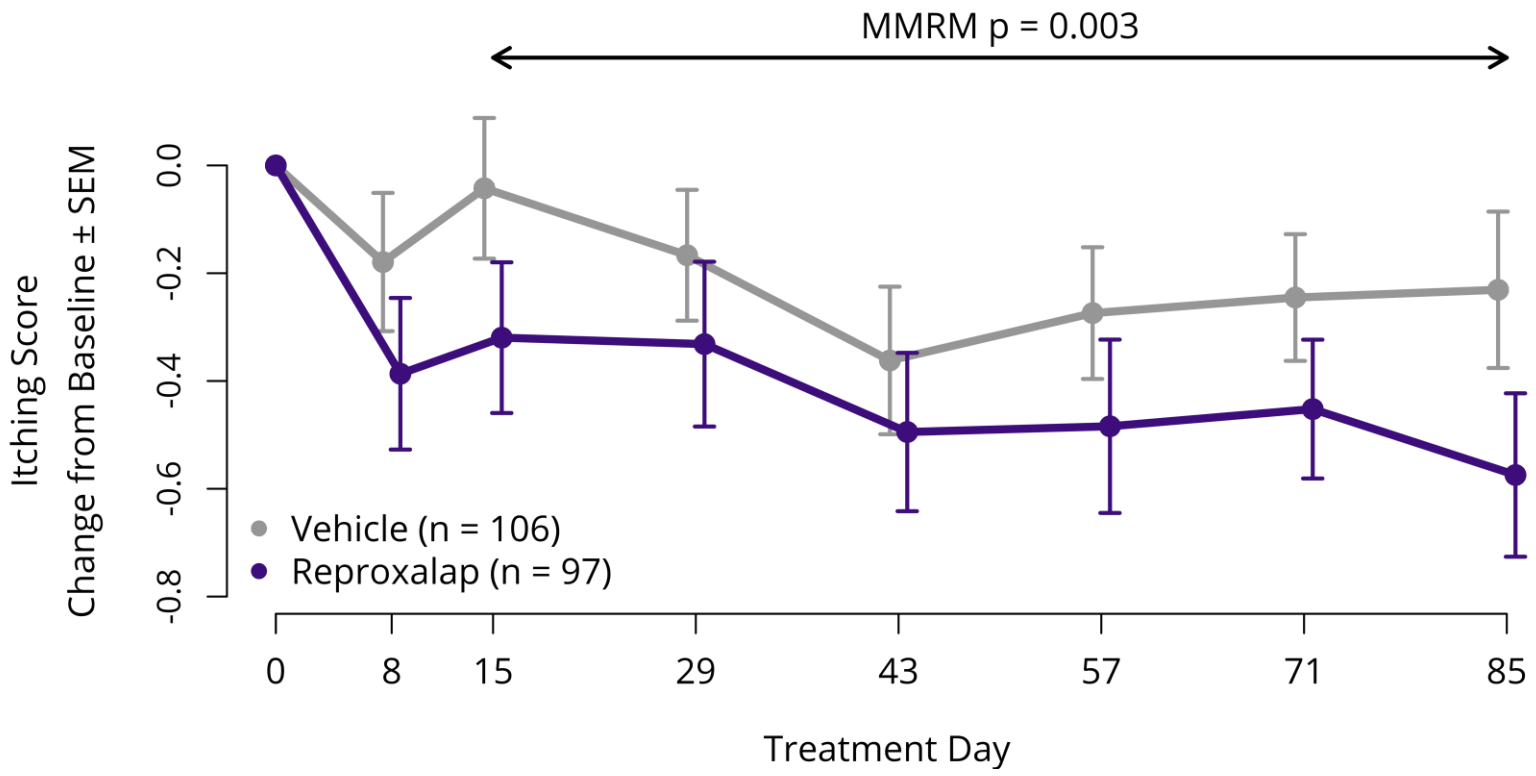
Reproxalap in Allergic Conjunctivitis

- Reproxalap has demonstrated robust drug activity in multiple allergic conjunctivitis clinical models.
- Reproxalap allergic conjunctivitis clinical trial results to date demonstrate:
  - Rapid and durable onset of activity.
  - Clinically relevant improvements in allergic itch.
  - Novel mechanism of action that is differentiated relative to currently available treatment options.
- INVIGORATE Phase 3 clinical trial ongoing with results expected H2 2020.

Reproxalap Demonstrated Statistically Significant Ocular Itch Reduction Over Vehicle in Dry Eye Disease Patients in RENEW-Part 1

DED Field Study

CAC Ocular Itching Score Change From Baseline



Reproxalap has demonstrated reduction in itch drug effect across four independent clinical models

DRY EYE DISEASE
- DED Field Study

ALLERGIC CONJUNCTIVITIS
- Conjunctival Allergen Challenge
- Allergen Chamber
- Allergen Field Study

Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials.
Source: RENEW-Part 1 clinical trial results (induction-maintenance dosing); Ocular itch scale 0 (no itch) to 4 (incapacitating itch).

CAC = Conjunctival Allergen Challenge
MMRM = Mixed Effect Model Repeated Measures

February 24, 2020

David Clark, M.D., Chief Medical Officer

Reproxalap in Allergic Conjunctivitis Q&A

Nasdaq: ALDX

aldeyra

BREAK

R&D Day 2020

Understanding Allergy and DED in the Landscape of Ocular Surface Diseases

Paul M. Karpecki, OD, FAAO
Director, Cornea Services, Kentucky Eye Institute, Gaddie Eye
Associate Professor, KYCO
Chief Medical Editor, Review of Optometry
Medical Director, KEPLR Vision
Practice Development Director, iOR Partners

Ocular Surface Diseases

- A number of very common conditions affecting the cornea, eyelids, and conjunctiva of the eye
- The most common OSDs include:
    - Allergic conjunctivitis
    - Dry eye disease
    - Blepharitis

Allergies

- A systemic condition
- An immune response to naturally occurring substances
- Can be severe and life threatening
  - e.g. anaphylaxis

Incidence

- Up to 30% of the US population suffer from some form of allergy and increasing
- *Fonacier L, Luchs J, Udell I. Ocular Allergies Current Concepts in Allergy and Asthma 2001 Jul;1(4):389-96*

- Allergies are the 6th leading cause of chronic disease in the US
- *Bielory L. Ocular allergy guidelines: a practical treatment algorithm. Drugs 2002; 62(11):1611-3*

Prevalence in Children

- Up to 40% of children!
- Allergic conjunctivitis is the most common ocular allergy syndrome among children
- More serious allergic eye diseases less common, but more devastating if not caught or treated early
- Average age of symptoms of DED ~ 26

Abelson MB, Granet D. Ocular allergy in pediatric practice. Current Allergy and Asthma Report. 2006 Jul;6(4):306-11

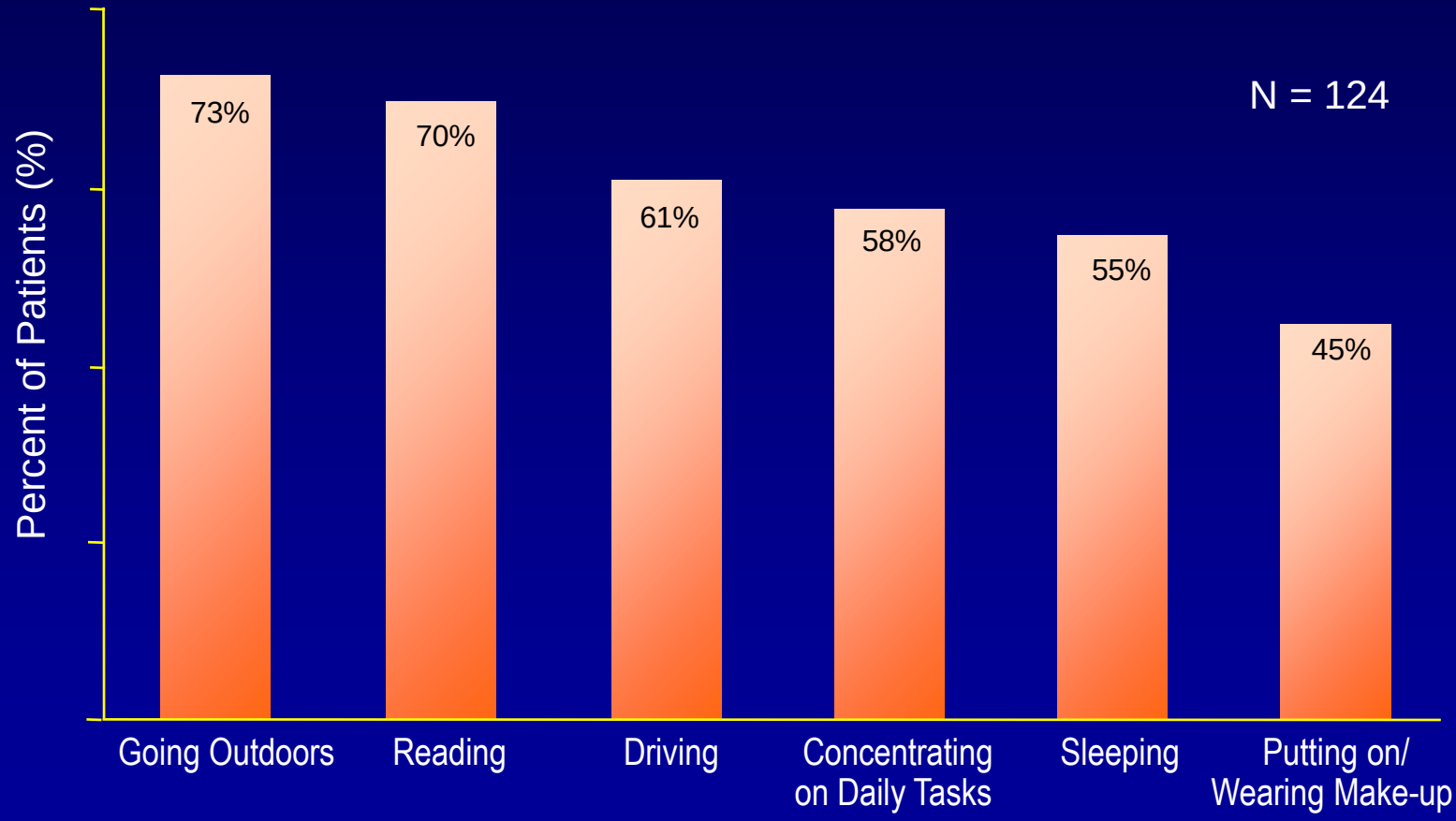
Prevalence is Increasing

- Due to numerous factors and theories:

- Hygiene theory
- Climate change
- Genetics
    - Studies have shown that if both parents suffer from allergies, the child has a 65% chance of developing them

Impact on Daily Activities

Assessed by the Eye Allergy Patient Impact Questionnaire

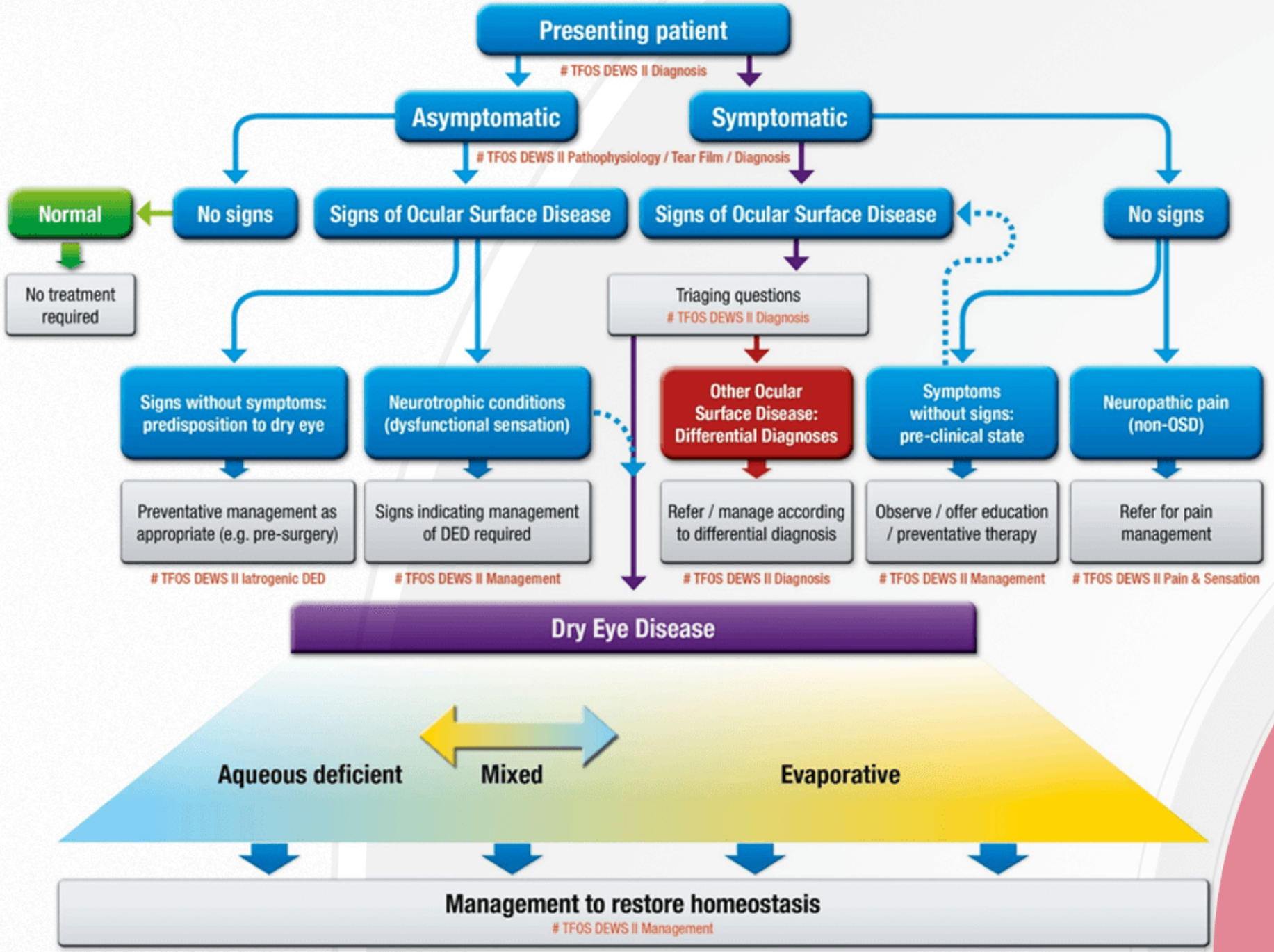


Lorenz et al. *J Outcomes Res*. 2003;7:21.

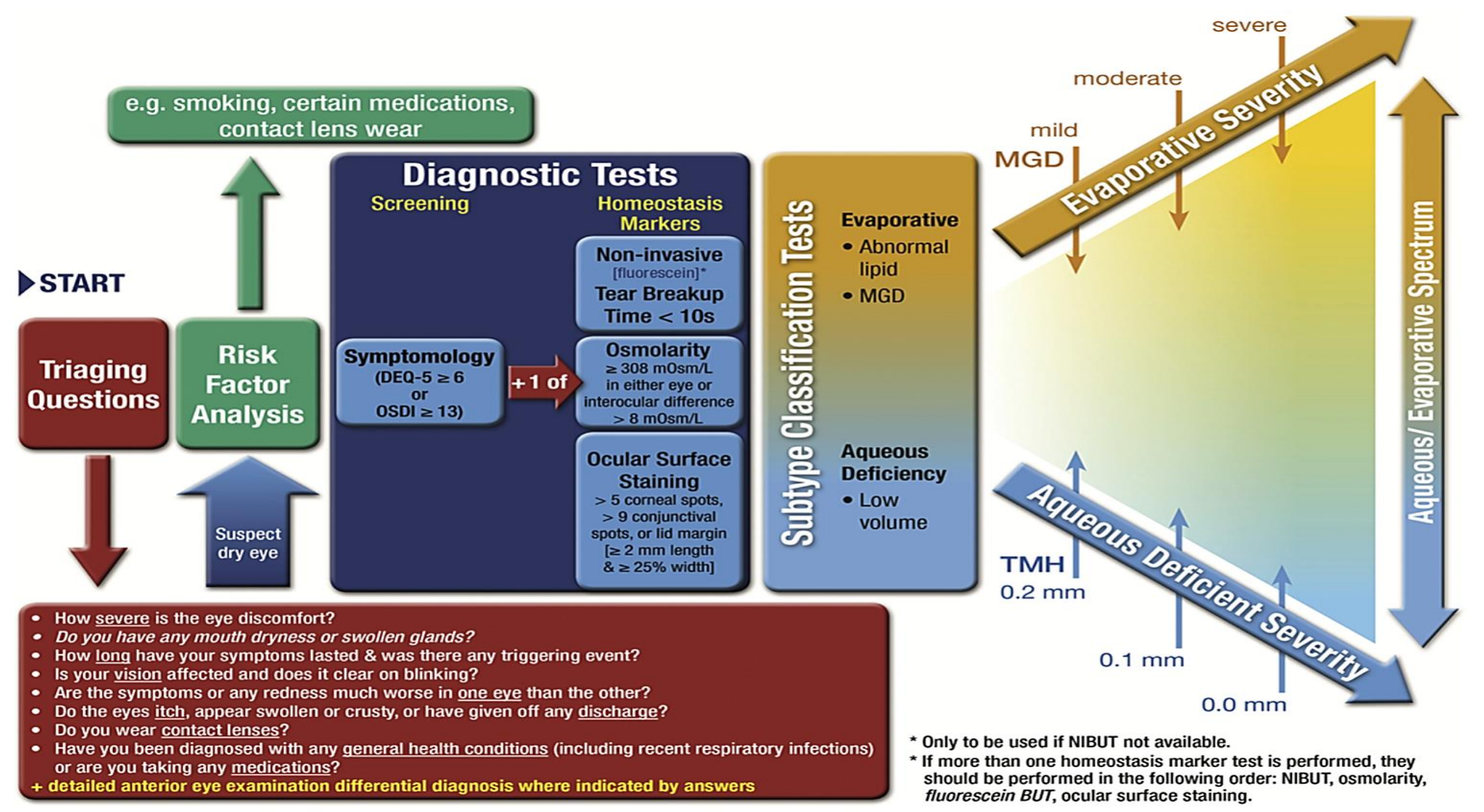
Allergic Eye Diseases

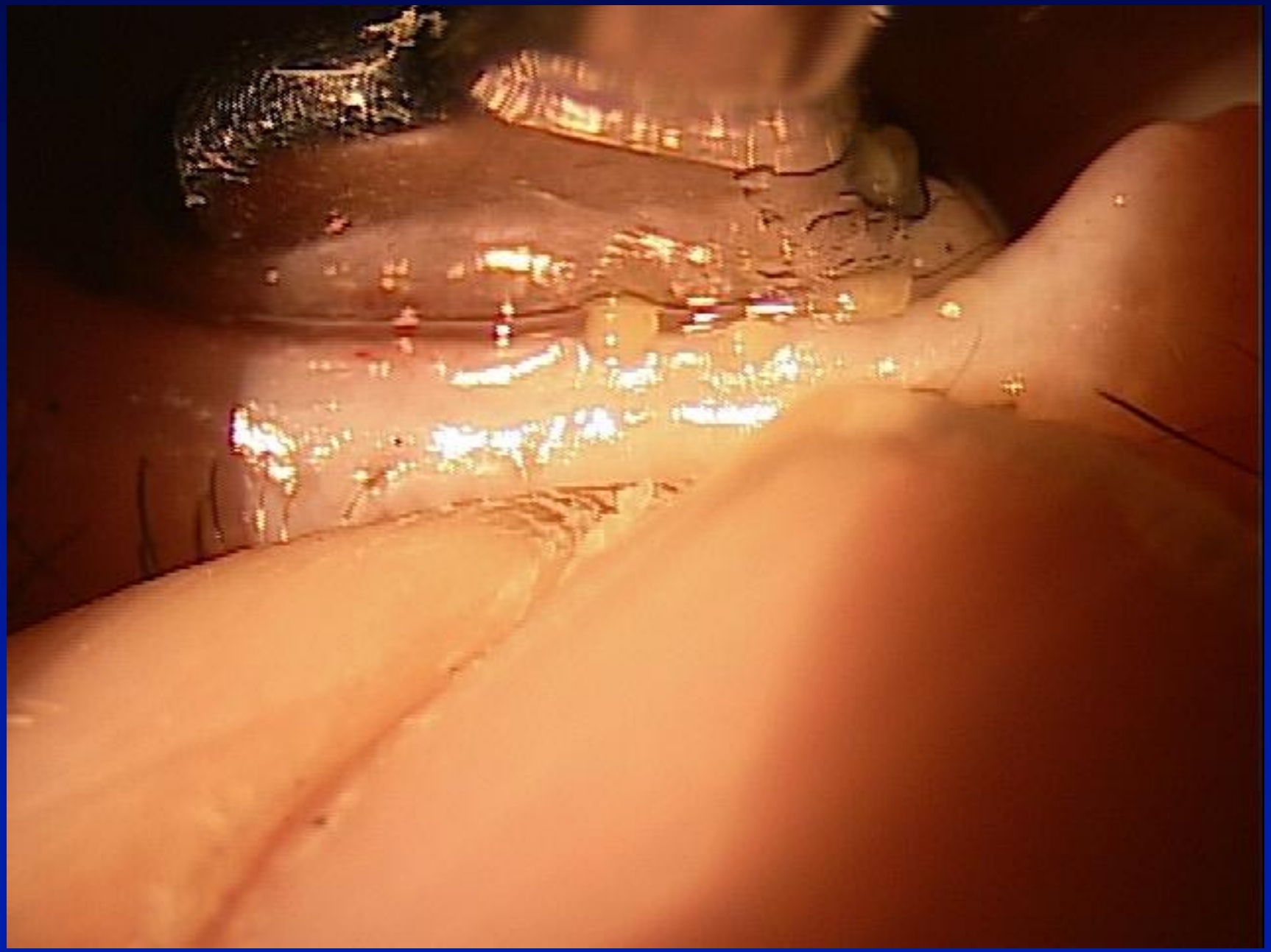
- Seasonal allergic conjunctivitis (SAC)
- Atopic keratoconjunctivitis (AKC)
- Vernal keratoconjunctivitis (VKC)
- Giant Papillary conjunctivitis (GPC)
- Perennial allergic conjunctivitis (PAC)

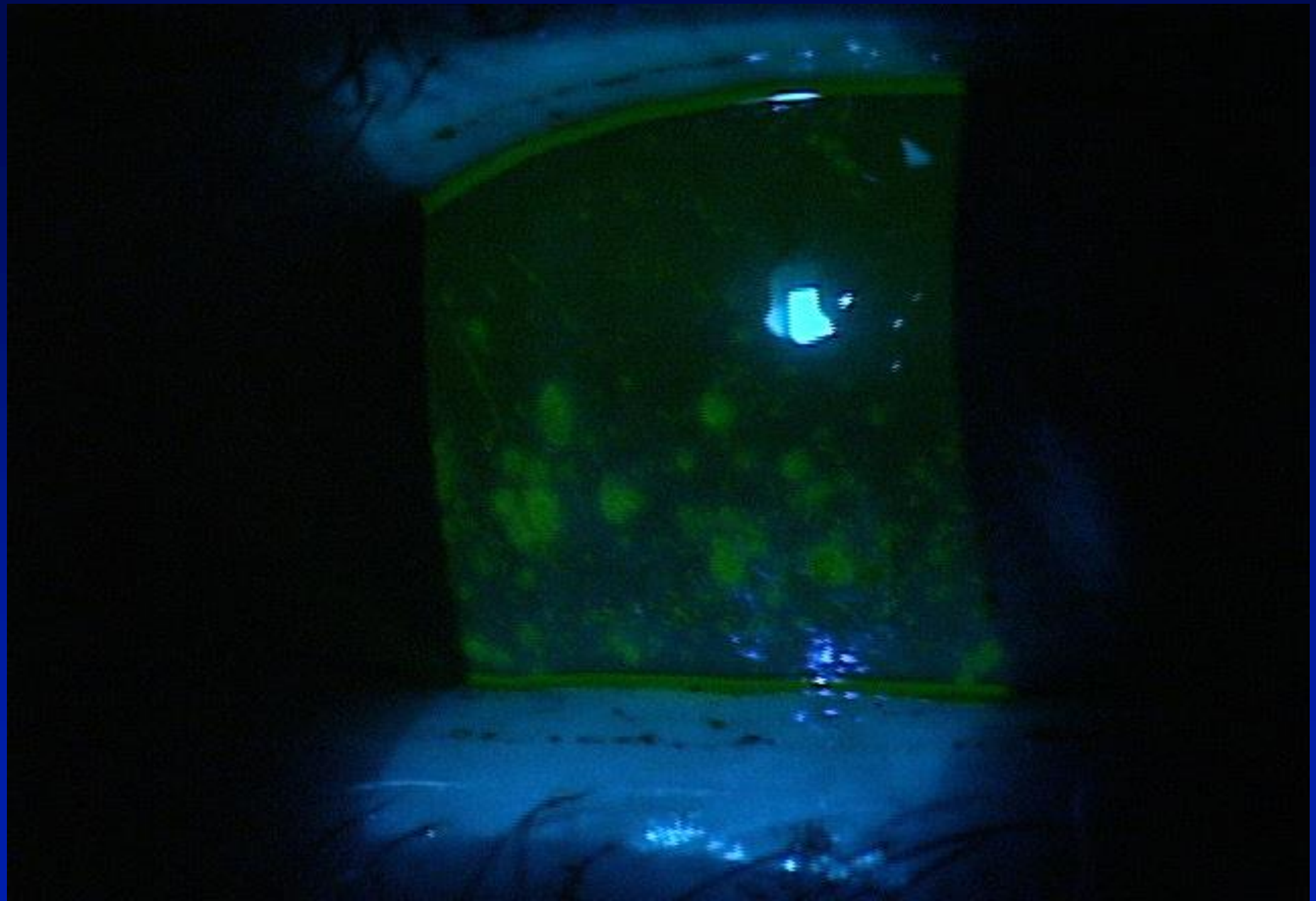
- All Type I hypersensitivity reactions


Presenting patient
TFOS DEWS II Diagnosis
Asymptomatic
Symptomatic
TFOS DEWS II Pathophysiology / Tear Film / Diagnosis
Normal
No signs
Signs of Ocular Surface Disease
Signs of Ocular Surface Disease
No signs
No treatment required
Triaging questions
TFOS DEWS II Diagnosis
Signs without symptoms: predisposition to dry eye
Neurotrophic conditions (dysfunctional sensation)
Other Ocular Surface Disease: Differential Diagnoses
Symptoms without signs: pre-clinical state
Neuropathic pain (non-OSD)
Preventative management as appropriate (e.g. pre-surgery)
Signs indicating management of DED required
Refer / manage according to differential diagnosis
Observe / offer education / preventative therapy
Refer for pain management
TFOS DEWS II Iatrogenic DED
TFOS DEWS II Management
TFOS DEWS II Diagnosis
TFOS DEWS II Management
TFOS DEWS II Pain & Sensation
Dry Eye Disease
Aqueous deficient
Mixed
Evaporative
Management to restore homeostasis
TFOS DEWS II Management

Diagnostic Methodology



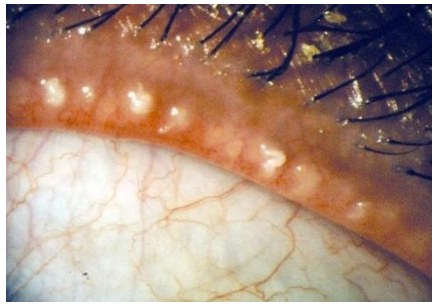


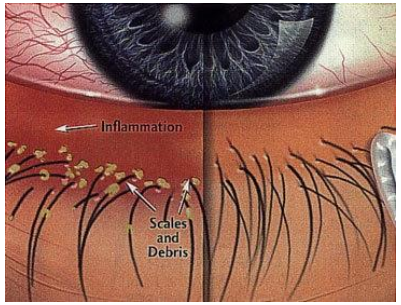


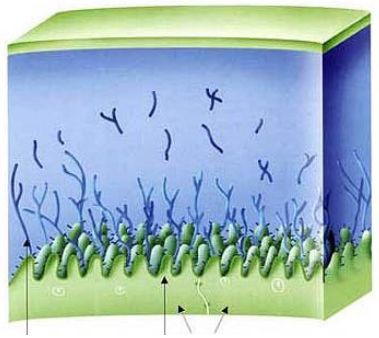
Most Common DED Treatments

- Eliminate exacerbating factors
  - smoking, air conditioner, meds.
- Tear replacements/ATs
- Warm compresses, lid hygiene, nutrition

- But none of these slow progression or treat the disease/inflammation







OBSTRUCTION

- Blink exercises
- Moist heat compress (Bruder)
- Lid debridement
- Thermal pulsation
- Thermal expression
- Manual expression

BIOFILM

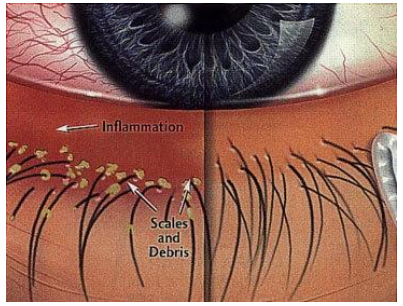
- Blepharoexfoliation (Blephex)
- Hypochlorous acid
- Tea tree oil
- Surfactant cleansers

INFLAMMATION

- Lifitegrast (Xiidra)
- Cyclosporine (Restasis/Cequa)
- Corticosteroids
- Omega fatty acids
- PO Doxycycline
- PO Azithromycin
- Topical macrolides
- IPL

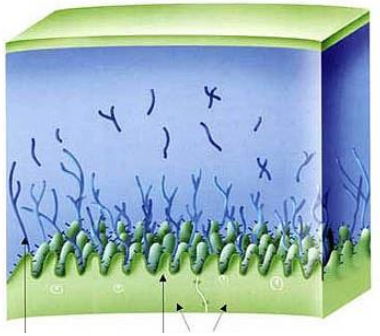
TEAR FILM

- Artificial tears
- Environment changes
- Increase hydration
- Punctal occlusion
- Neurostimulation
- Brimonidine 0.25%



INFLAMMATION

- Lifitegrast (Xiidra)
- Cyclosporine (Restasis)
- Corticosteroids
- Omega fatty acids
- PO Doxycycline
- PO Azithromycin
- Amniotic membrane



TEAR VOLUME

- Artificial tears
- Environment changes
- Increase hydration
- Punctal occlusion
- Neurostimulation
- Cevimeline PO (Evoxac)
- Autologous serum q2h
- Scleral lenses

Monitor for MGD

Most Significant Challenges for ECPs in Treating Ocular Allergies

- Managing co-morbidity of dry eye with AC
- Maintaining patients in contact lenses
  - Oral antihistamines dry the eyes
  - Dry eye patients can't wash away the allergens on the ocular surface

- *Welch D, Ousler GW, Nally LA et al. Ocular drying associated with oral antihistamines (loratadine) in the normal population-an evaluation of exaggerated dose effect. Adv Exp Med Biol. 2002;506(Pt B):1051-5.*
- *Bielory L. Ocular toxicity of systemic asthma and allergy treatments. Curr Allergy Asthma Rep. 2006 Jul;6(4):299-305.*

Oral OTC Allergy Meds

- Most patients (>80%) seek OTC options prior to visiting a doctor's office
- Primary treatment is oral anti-histamines
- Can exacerbate the ocular condition
- Incidence of dry eye ~14.4%

Beaver Dam study data – over age 40
BOSS Study Paulsen age 21 and older

Dry Eye and Allergy

- Need adequate tears to wash away allergens
- M3 Muscarinic receptor effects of oral antihistamines
  - 50% reduction in tear production (M. Abelson)
  - Loratadine 34% reduction in tear volume after 4 days (Ousler)
- Compounding effects

Dry Eye and Allergy

- Difficult to separate the two
- E.g. symptoms of tearing, burning, grittiness, stinging eyes
- More common to see the vague symptoms
- Signs of inflammation are similar regardless of disease cause

Hom Study Summary

- AC and DED are two of the most common OSD disorders
- N=689, patient age range 5-90 (median age 25)
  - 28.2% had itchiness
  - 35.8% dry eyes
  - 28.2% redness

Hom Study Summary

- Of the 194 patients (28.2%) with itching, 57.7% had clinically significant dryness
- Of the 247 patients with dry eyes, 112 (44.3%) had clinically significant itch
- The odds of a patient with itching eyes experiencing dry eyes was 2.11 times and the odds of these patients also experiencing redness was 7.34 times
- It appears these two conditions (AC & DED) are most often concomitant

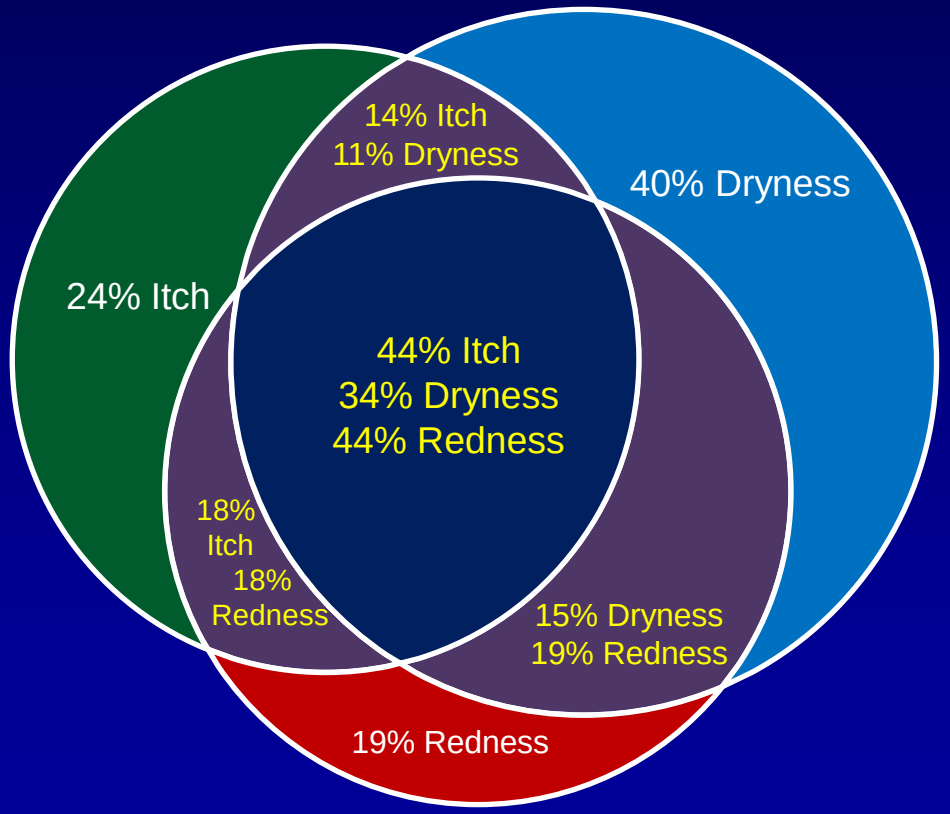
Hom Study: AC and DED Clinically Manifest Similar Symptoms and Readily Mimic Each Other

Allergic Conjunctivitis and Dry Eye Disease

Patients with a history of AC (n=689) screened for clinically significant itching, dryness, and redness.

Clinically Significant Score	Total No. (%) of Clinically Significant Patients
Itch	194 (28%)
Dryness	247 (36%)
Redness	194 (28%)
Itch and dryness	112 (16%)
Itch and redness	120 (17%)
Dryness and redness	122 (18%)

Relationship Among Subgroups

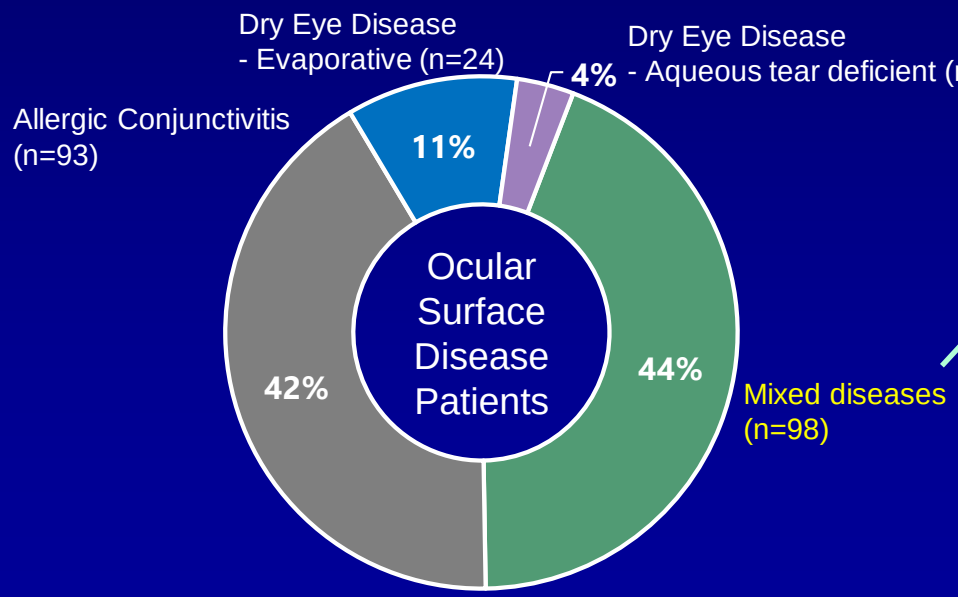


Hom, M.M., Nguyen, A.L., and Bielory, L., 2012. *Annals of Allergy, Asthma & Immunology*, 108:163-166.

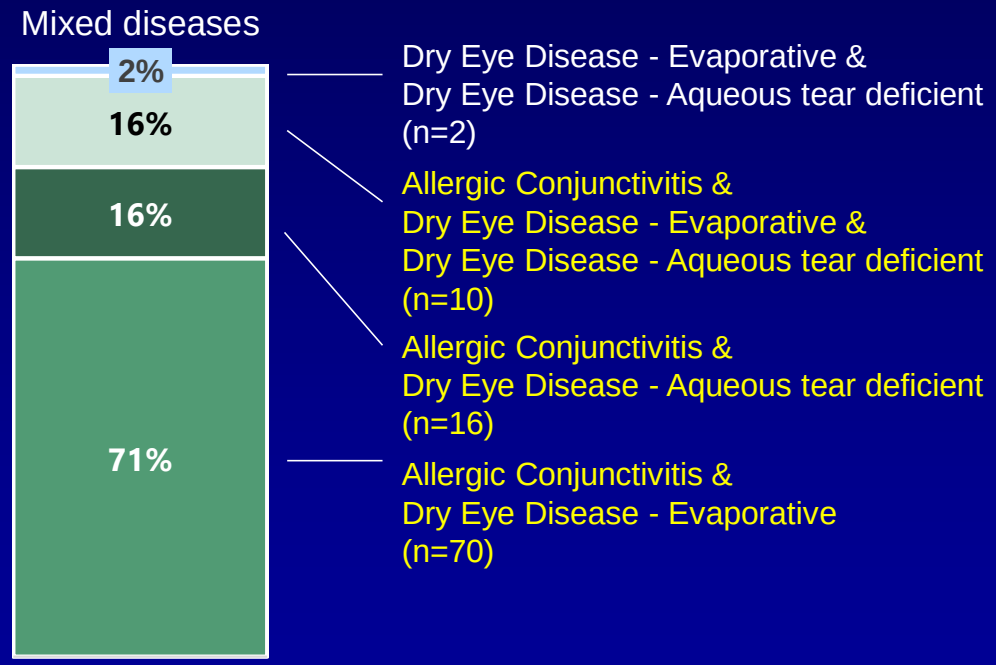
Opitz Conference Paper: Ocular Surface Disease Patients Often Have DED and AC Co-Morbidity

Prevalence of Co-Morbid Ocular Surface Diseases

Ocular surface disease patients (n=258) were classified into evaporative dry eye, aqueous tear deficient dry eye, allergic conjunctivitis, or mixed (co-morbid) disease categories using objective tests.



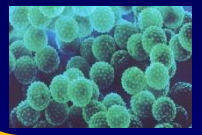
Mixed Combination of Conditions



Opitz, D.K,. Kwan, J. et al., 2014 ARVO Conference Paper.

Allergic Conjunctivitis and Dry Eye Disease Are Interrelated Inflammatory Ocular Surface Diseases

The Three P's of Ocular Surface Inflammation:



Pollens

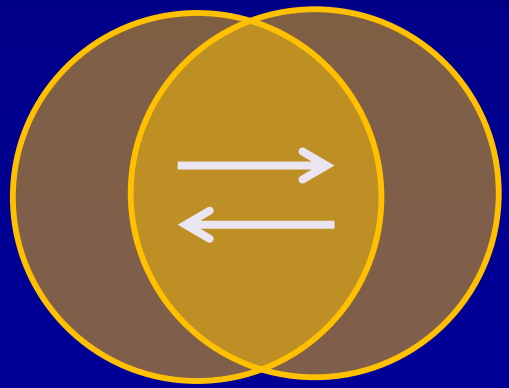
Pollutants

Parched Environments

Allergens

Irritating Air

Allergic Conjunctivitis



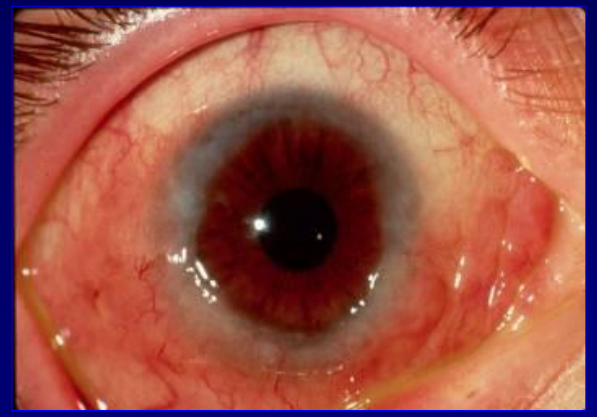
Dry Eye Disease

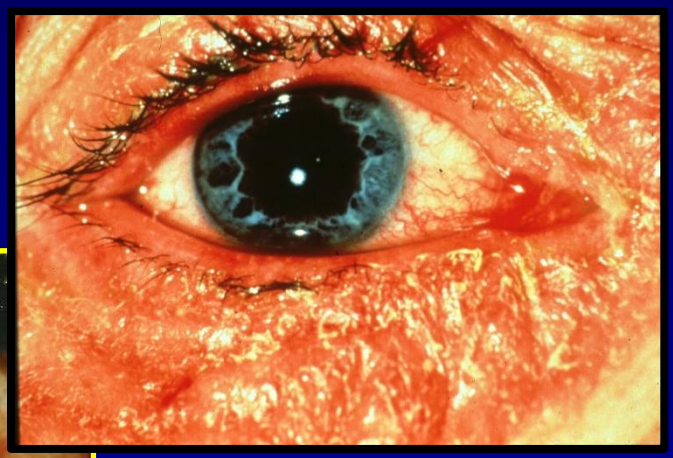
- Allergic response can compromise tear film
- Dry eye oxidative stress can enhance allergic response
- Dry, polluted environments exacerbate both conditions

"The clear interaction of allergy, dry eye and environmental irritants makes untangling their etiology in prevalence studies difficult."

"The Whipsaw of Allergic Dry Eye" by Mark B. Abelson, MD and Lauren Lilyestrom in REVIEW of Ophthalmology; October 2008.

Types of Allergic Eye Disease





Seasonal vs. Perennial Allergic Conjunctivitis

- Allergens seasonally present
  - Tree, grass, weed pollens

- Allergens always present
  - Animal dander
  - Dust mites
  - Molds

Allergic Conjunctivitis

Perennial Allergic Conjunctivitis

- Milder than seasonal allergy
  - ➢ Associated with asthma
  - ➢ Year round problem & indoors
  - ➢ High pollen counts
- 70-80% allergic to dust mite droppings:
  - ➢ Mites are 10-24μ
  - ➢ 10-20 waste pellets/day
  - ➢ 1 gram dust = 240,000 droppings

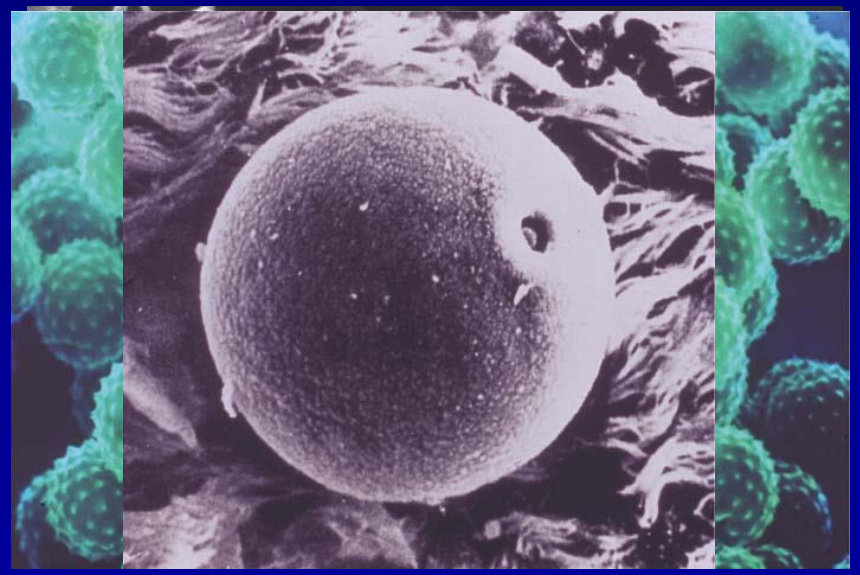
Acute Allergic Conjunctivitis or Seasonal Allergic Conjunctivitis

- Ragweed, pollen, mold
- Higher incidence at certain times of the year
- Perennial allergic conjunctivitis (PAC)
  - All year
  - e.g. animal dander, dust,
  - Indoor allergies

Acute Allergic Conjunctivitis

Seasonal Allergic Conjunctivitis

- Environmental allergens
  - ➢ Animal Dander
  - ➢ Ragweed
  - ➢ Grass Pollen

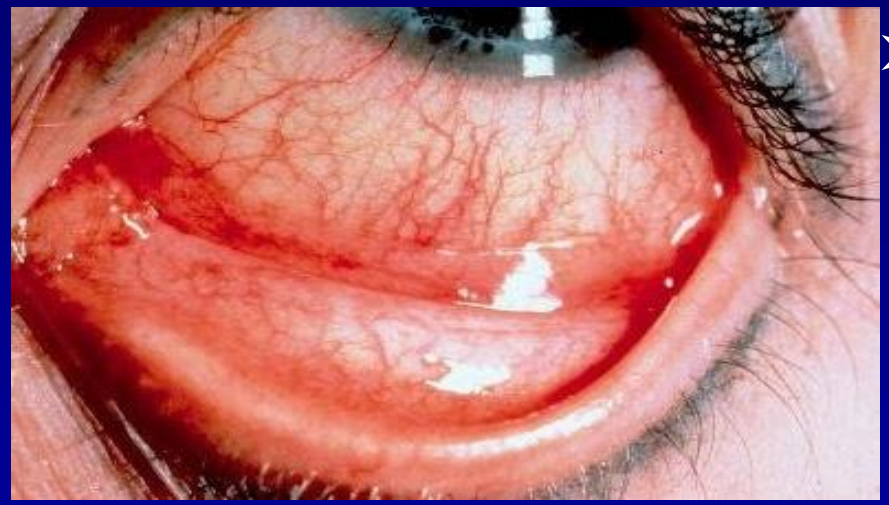


SAC Treatment

- Palliative Recommendations:
  - Preservative free tears
  - Cool compresses

Acute Allergic Conjunctivitis

Signs



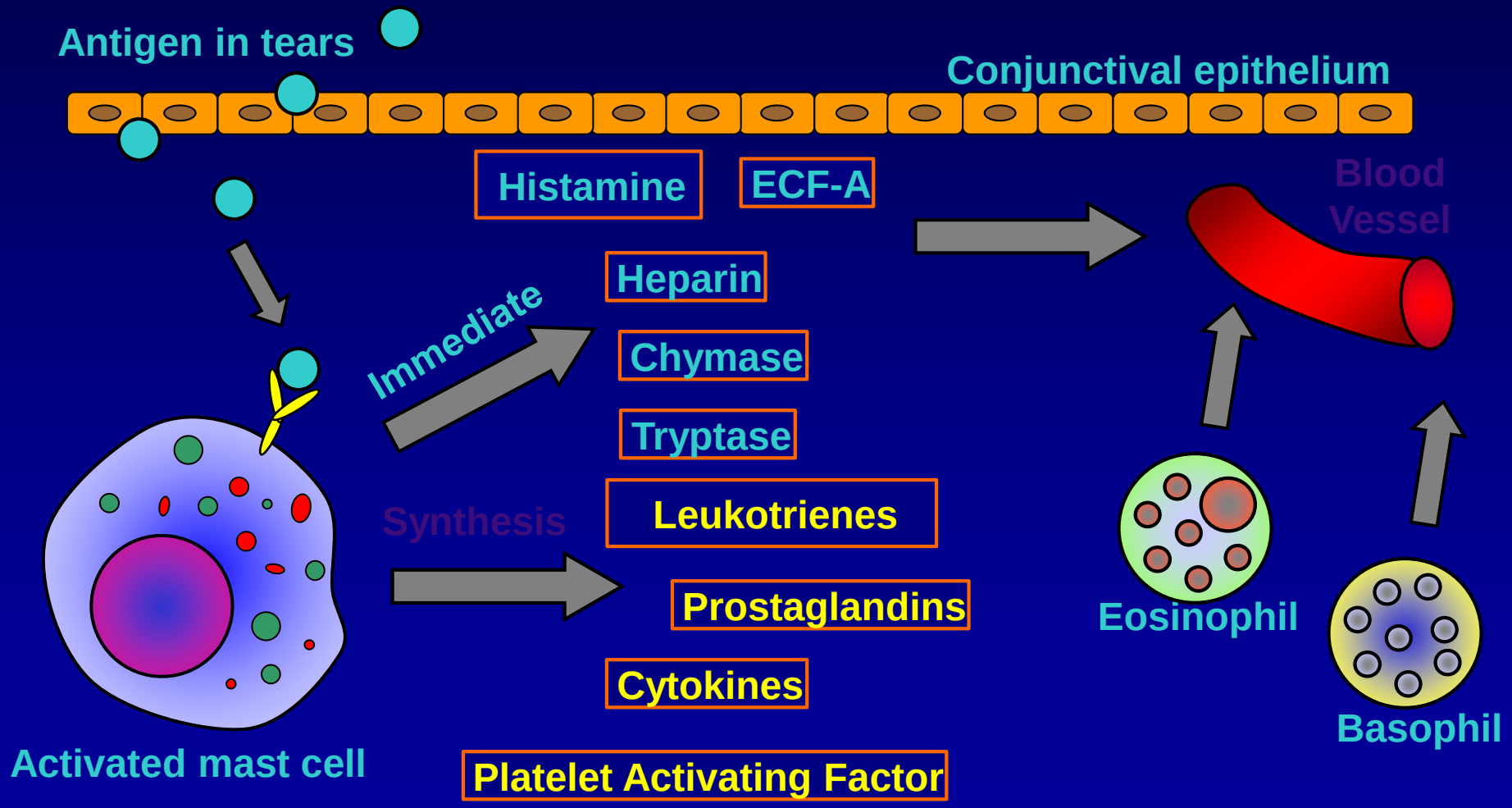
- Hyperemia
- Chemosis
- Mucous Discharge
- Lid Edema

Clinical Presentation

Symptoms:

- Ocular itching
- Burning
- Tearing
- Redness
- Sensitivity to light
- Grittiness/foreign-body sensation
- Blurred vision

The Early (Acute) Allergic Response



Adapted with permission from Lichtenstein LM. Allergy and the immune system. *Scientific Am.* 1993;269:117-124.

SAC Symptoms (Itch)

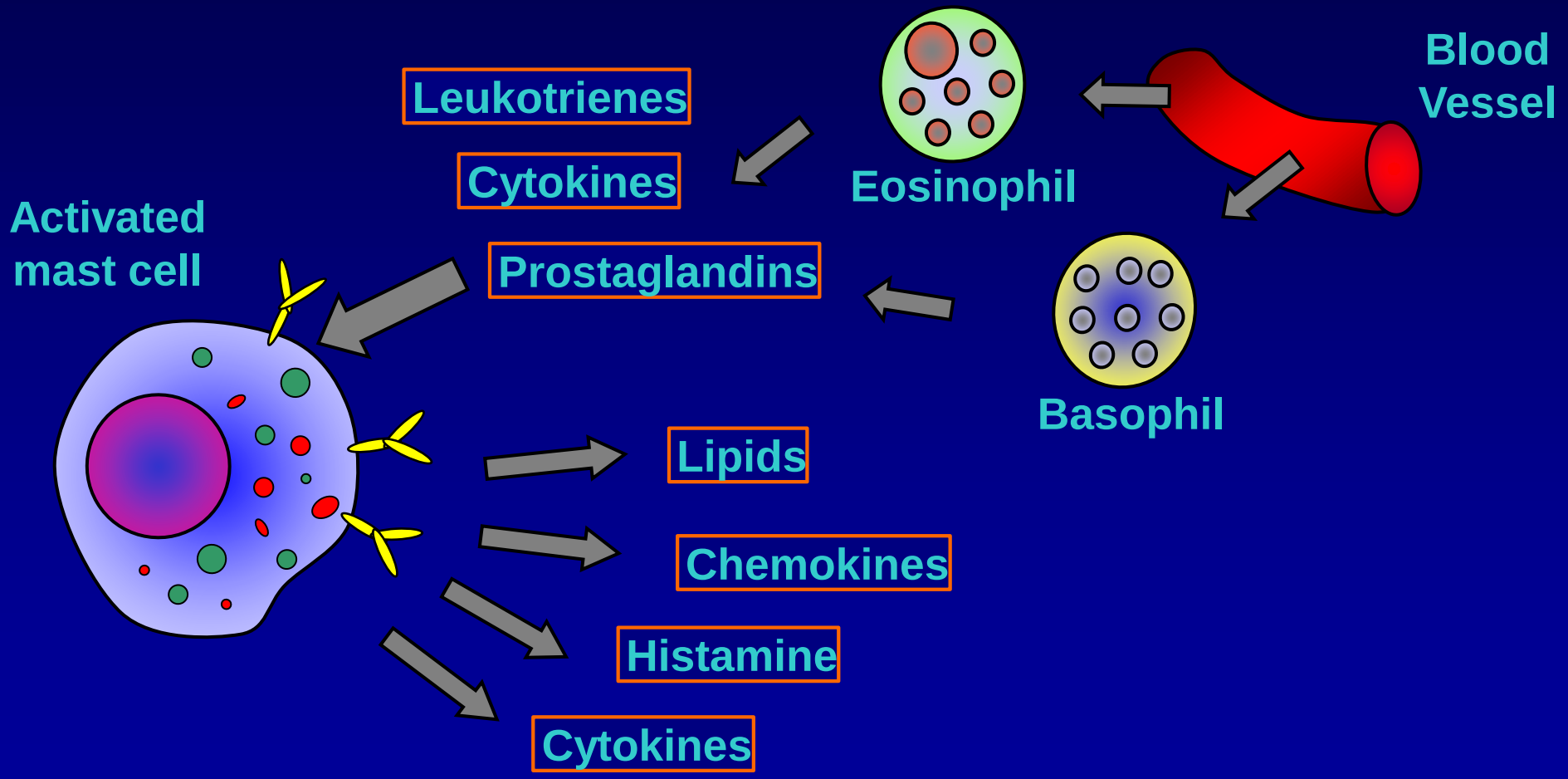
- Antihistamine/mast cell stabilizer combination drops
- Better on symptoms but no indication for signs

SAC Signs

- Moderate to severe erythema and edema

- Steroid drops
- Slower acting but better on signs (redness and chemosis/swelling)

The Late Phase Allergic Response



Adapted with permission from Lichtenstein LM. Allergy and the immune system. *Scientific Am.* 1993;269:117-124.

Need for a New Therapy

- One that acts on signs and symptoms
- Works like a steroid without the long-term risks and side effects
- One that won't add to the dry eye co-morbidity

Optometry at the Front Line

- 88% of all comprehensive eye exams
- 431 graduating ophthalmology residents- essentially the same over 30 years
- 76 million baby boomers needing cataract surgery
- Estimates for FTE's required: ~24,000 MDs
- Currently there are only ~ 18,000 MDs
- 40,000 ODs

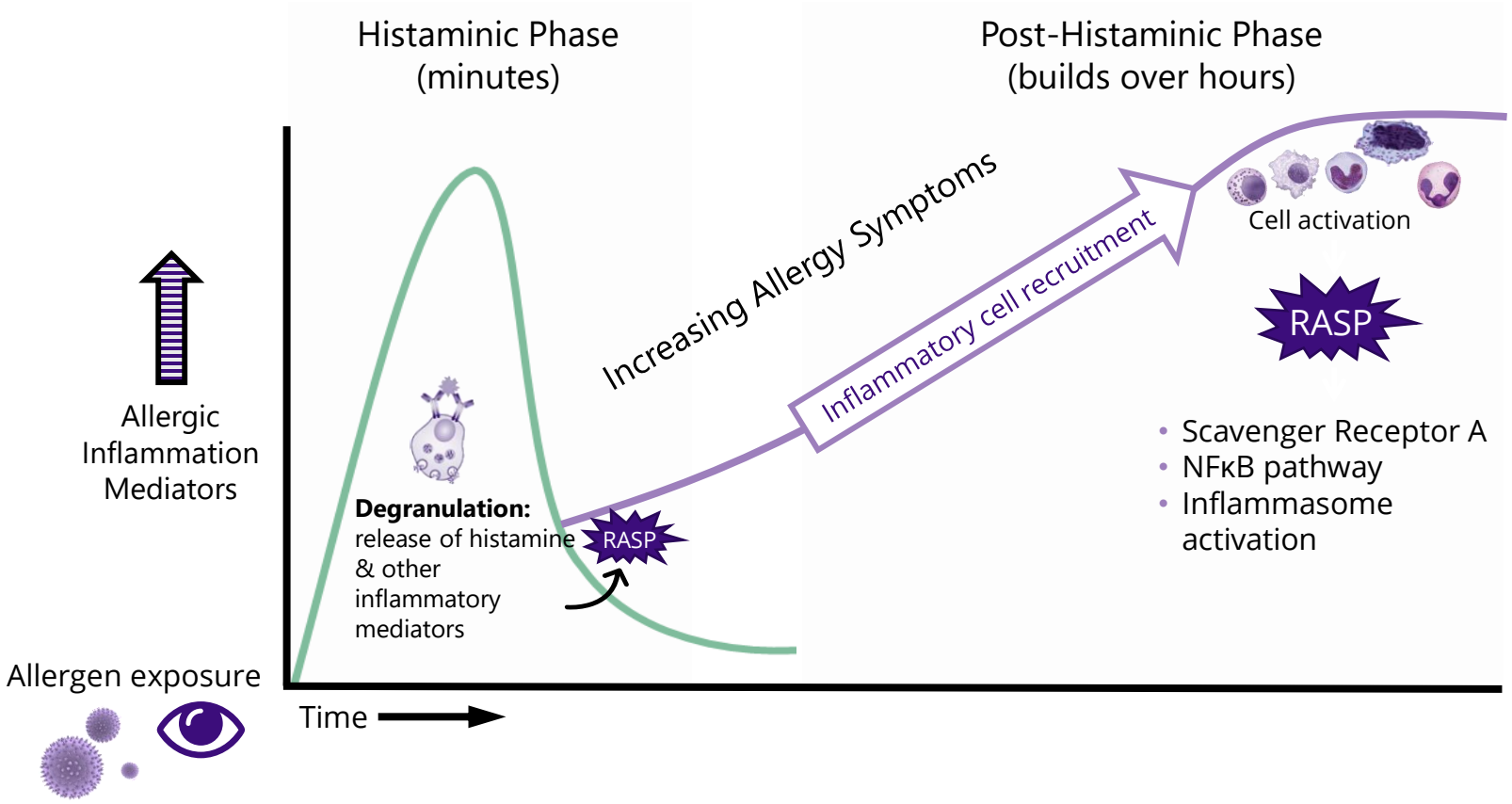
Need for Versatile Therapeutics to Treat Inflammation

- The one consistent component of all OSD's is inflammation
- Corticosteroids have limitations
    - Short term therapy/flare ups and these OSDs are chronic conditions
    - IOP rise, PSC cataracts, secondary infections if used long-term
- Potential for RASP inhibition is significant as is evident by the high levels in patients with OSD

Need for Versatile Therapeutics to Treat Inflammation

- Doctors have difficulty differentiating DED from AC (and blepharitis)
- Co-morbidities are very large making it more difficult
- Need for a single drug class that can safely and effectively treat the inflammation, regardless of the type of OSD

Reproxalap's Novel Mechanism of Action Has The Potential to Provide Differentiated Activity Versus Antihistamines



Reproxalap

- Reproxalap irreversibly inhibits RASP, limiting allergic inflammation.
- Reproxalap has the potential to provide differentiated activity in post-histaminic allergy, which affects all allergic conjunctivitis patients.

aldeyra

RASP = Reactive Aldehyde Species

What may I answer?

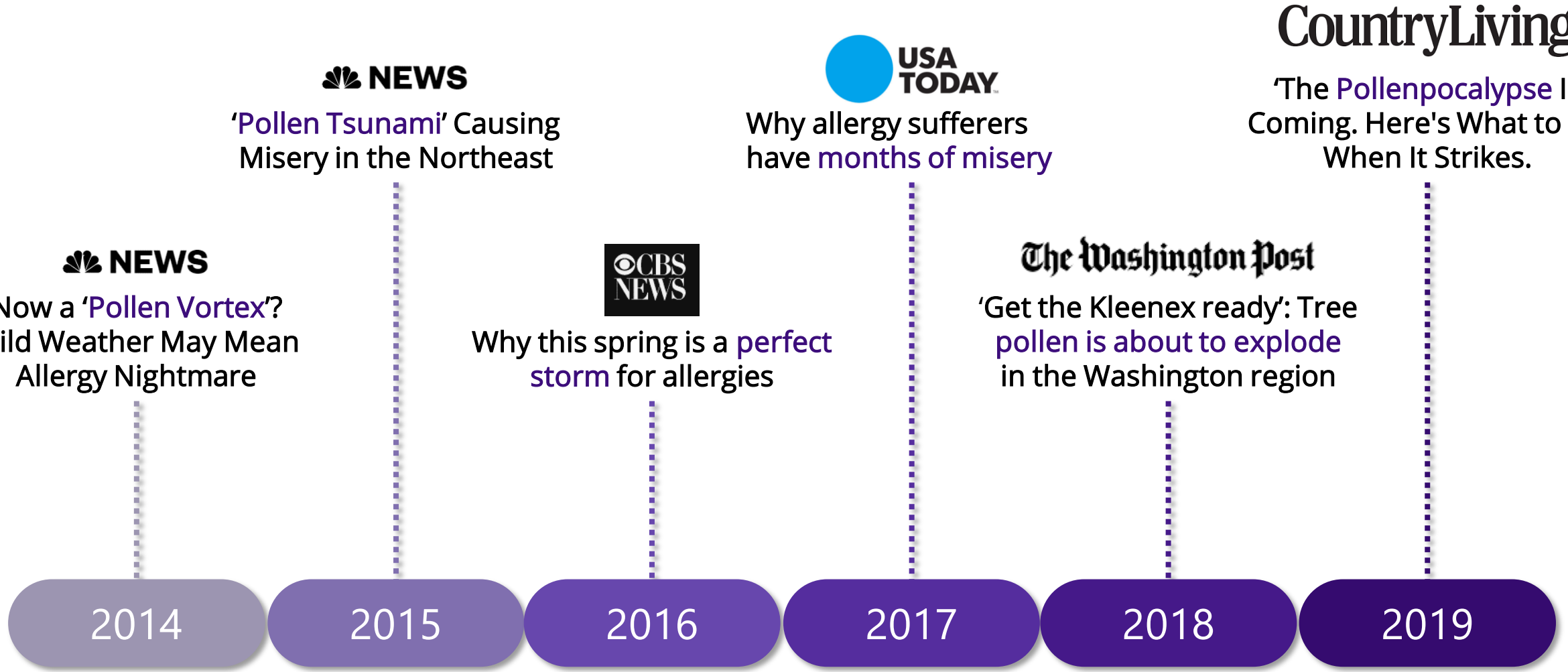
February 24, 2020

David McMullin, Chief Commercial Officer

Allergic Conjunctivitis Market Opportunity

Nasdaq: ALDX

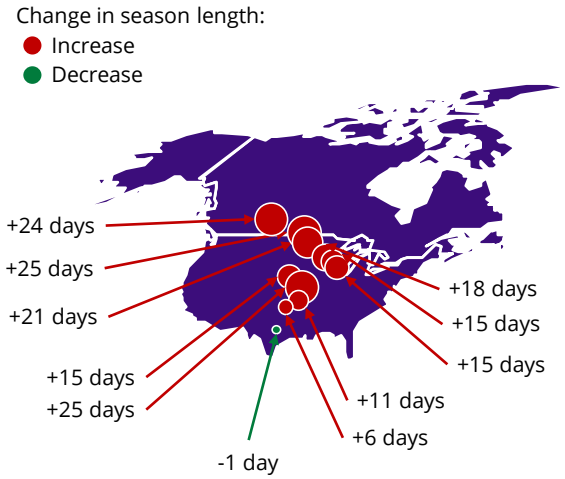
Allergy Season: A Timeline



Allergy Seasons Are Getting Longer, Broader, and Denser
A Trend Likely to Persist for Decades to Come

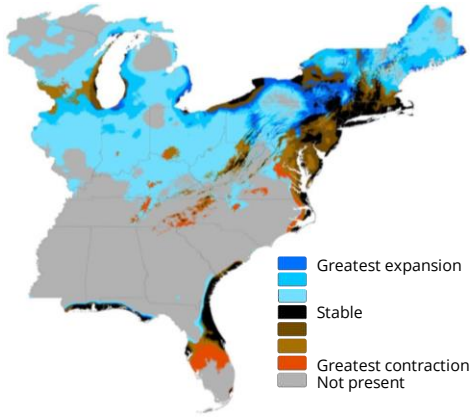
Longer

Change in Ragweed Pollen Season Length: 1995-2015[1]



Broader

Projected Change in Ragweed Distribution by 2050[2]

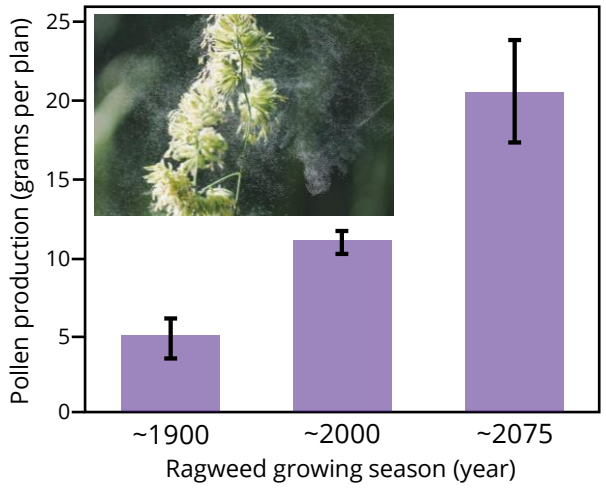


Projected net change in suitable area (Km^2) for common ragweed vs. current distribution:

Low scenario	+94%
High scenario	+120%

Denser

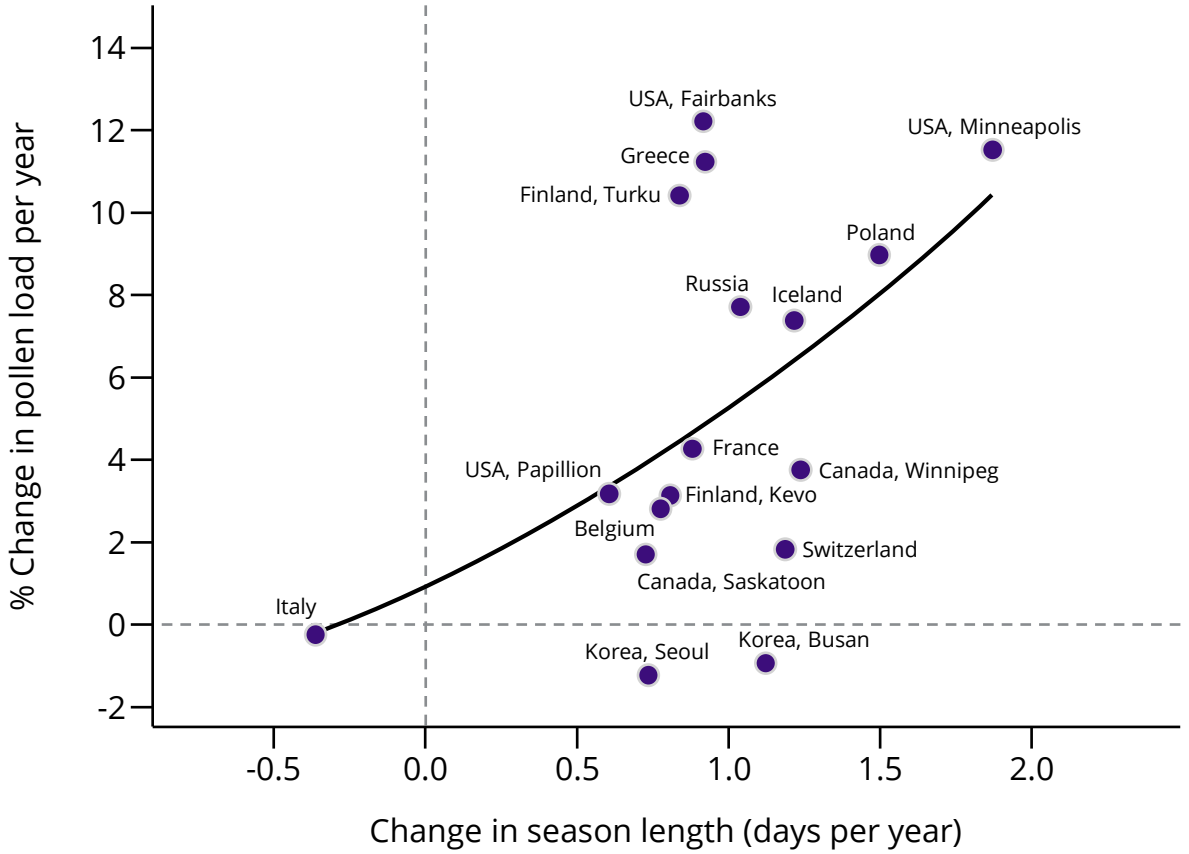
Ragweed Pollen Production by Year[3]



1. Ziska, L., K. Knowlton, C. Rogers, National Allergy Bureau, Aerobiology Research Laboratories, Canada. 2016 update to data originally published in: Ziska, L. et al., 2011. *Proceeding of the National Academy of Sciences USA*; 108(10): 4248-4251.
2. Case, M.J., Stinson K.A., 2018. *PLOS ONE*, 13(10): e0205677. https://doi.org/10.1371/journal.pone.0205677.
3. Ziska, L.H., and F.A. Caulfield, 2000. *Australian Journal of Plant Physiology*, 27(10): 893-898.

Growing Burden of Pollen Related Allergies is a Global Phenomenon

Changes in Pollen Load and Season Duration
Across The Northern Hemisphere Over The Last 20+ Years[1]



71% of studied locations showed significant increases in seasonal pollen concentration

65% of studied locations showed significantly extended pollen seasons

Public Health Implications[2]

- Boost in number of sensitized individuals
- Increased lost work and school days
- Increased treatment requirements

"It looks like a good time to invest in pollen allergy medication."
Kim Knowlton, Columbia University

aldeyra

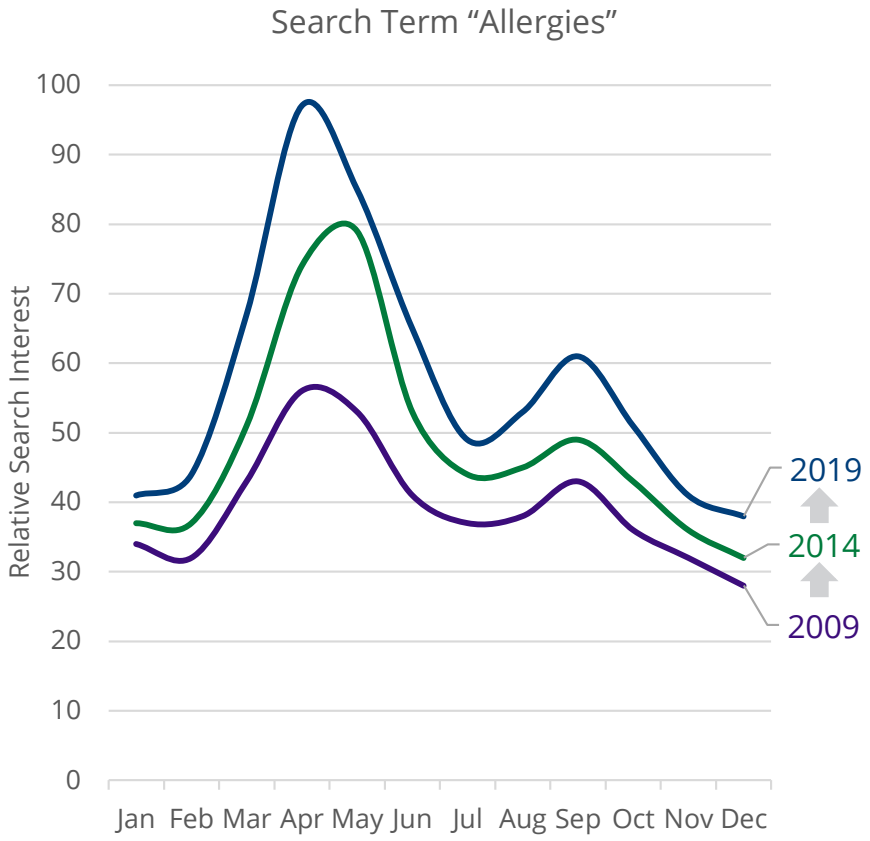
1. Liska, L.H., Harry, S.K. et al., 2019. *The Lancet*, 3(3):e124-e131. The average length of long-term pollen measurements analyzed was ~26 years.
2. "It's Official: Climate Change Worsens Global Pollen Season" by Kim Knowlton in NDRC Expert Blog; March 2019.

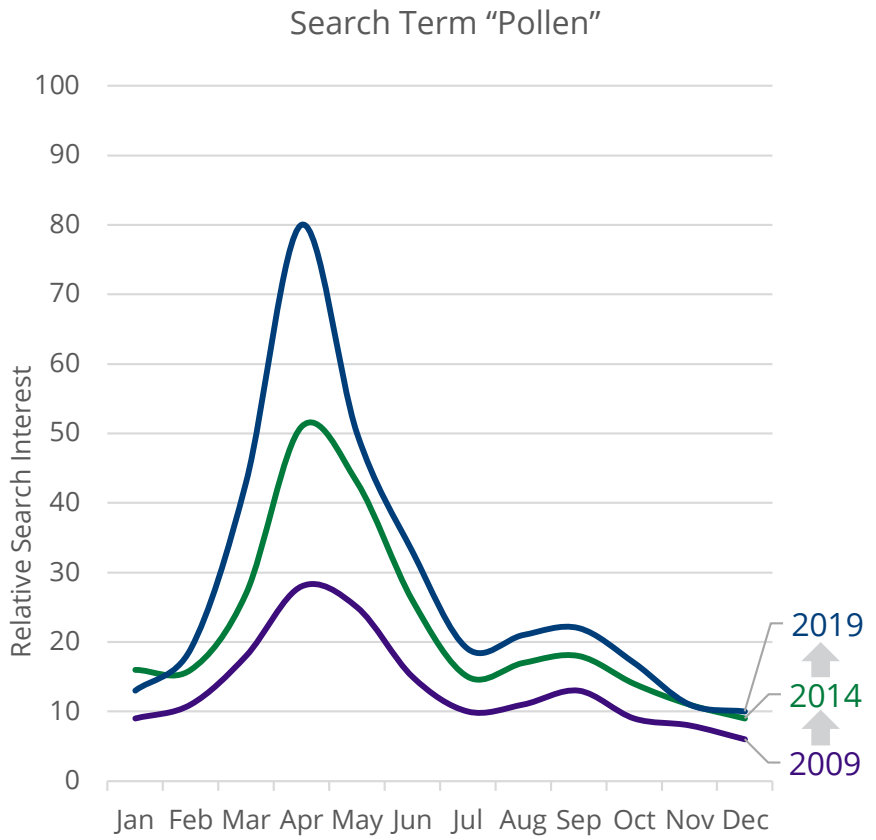
Seasonal Allergy Patients Are Feeling The Impact

Source: “Grass pollen season tough on those with allergies, asthma” by Jack Moran in The Register-Guard; May 2018.
Respiratory therapist talks about asthma and pollen at PeaceHealth Sacred Heart Medical Center.

Record Levels of Consumers Are Searching for Information on (and Solutions to) Allergies and Pollen Every Year

Changes in Search Term Trends in the United States
Over The Last 10 Years

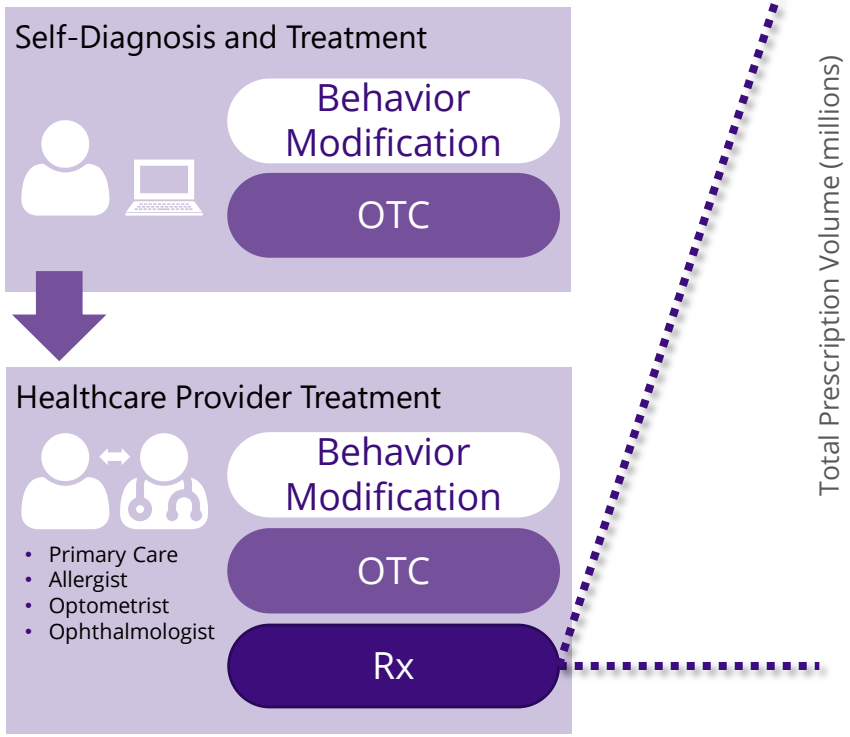




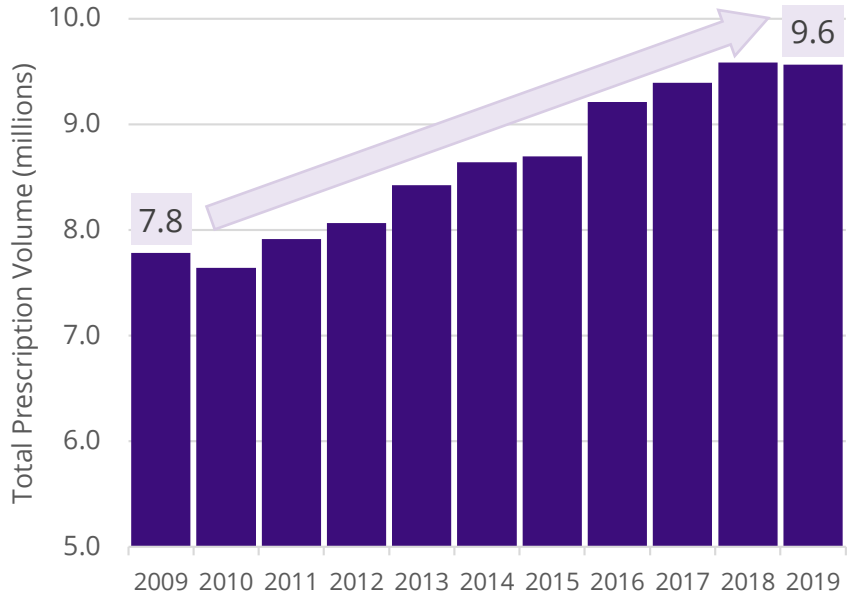
Source: Google Trends (https://www.google.com/trends).

Allergic Conjunctivitis Prescription Volume Has Grown 3x Faster Than the General Population Over the Past Ten Years

Allergic Conjunctivitis Patient Journey



Allergic Conjunctivitis Total Prescriptions (TRx)
United States



- Antihistamines available OTC
- No novel Rx launches
- Minimal promotion

TRx Demand Outpacing Population Growth

Allergic conjunctivitis **prescription volume has grown 3x faster** than the U.S. population.

2.1% U.S. Allergic conjunctivitis TRx 10 year CAGR

vs.

0.7% U.S. population 10 year CAGR

Source: Bloomberg (Symphony Health - U.S. Estimates); Worldometer (U.N. Population Division World Population Prospects); Aldeyra Therapeutics patient and physician market research.

The Allergic Conjunctivitis Treatment Landscape Has Been Stagnant With No Novel Drug Entrant in Decades

Allergic Conjunctivitis Eye Drop Drug Class:	Vasoconstrictors (Decongestants)	Antihistamines	Mast Cell Stabilizers	NSAIDs	Corticosteroids
First Available:	1950s	1950s – 1st generation (mono and combo-with vasoconstrictors) 1990s – 2nd generation	1980s	Late 1990s	Late 1990s
Availability Today:	OTC	OTC & Rx	Rx	Rx	Rx
Limitation:	• Rebound redness	• Narrow MOA (histamine) • Can cause eye dryness	• Slow, requiring pre-loading period of up to two weeks	• Narrow MOA (prostaglandins) • Safety precautions	• Short-term use only • Safety precautions

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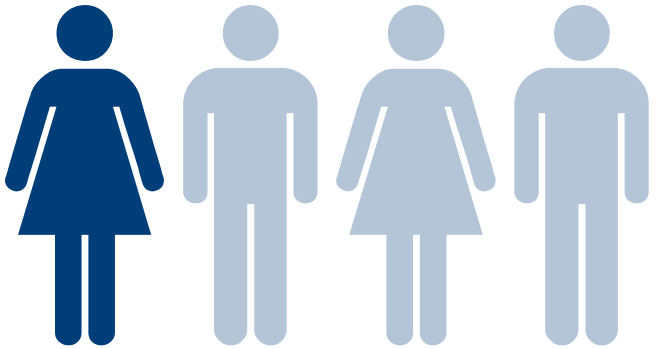
MOA = Mechanism of action

Some Allergic Conjunctivitis Patients Utilize Multiple Rx Treatments, and Nearly 1 in 4 Use Current Non-Antihistamine Rx Alternatives

1 in 10

1 in 10 diagnosed allergic conjunctivitis patients are being **prescribed more than one Rx eye drop** for their condition.

1 in 4



Nearly **1 in 4** of diagnosed allergic conjunctivitis patients **are using Rx corticosteroid and/or NSAID eye drops.**

Ophthalmologists and optometrists report that antihistamines are not at all effective or only partially effective in about half of their treated allergic conjunctivitis patients.[1]

1. Physician market research completed by Aldeyra Therapeutics.
Source: IQVIA analysis of diagnosed AC patients utilizing topical ocular Rx treatments.

Reproxalap Has the Potential to Be the First Novel Drug For Allergic Conjunctivitis in Decades, Representing A Unique Market Opportunity

	Likelihood of Trying a Novel MOA for Allergic Conjunctivitis	% of AC Patients Where Reproxalap Could Be Prescribed	Where Reproxalap Fits Into the AC Treatment Algorithm
Ophthalmologists	83% Probably or definitely would try	~45% of AC patients to whom you would prescribe reproxalap	• Moderate to severe allergic conjunctivitis patients • Adjunct treatment to antihistamines • In lieu of corticosteroids
Optometrists	92% Probably or definitely would try	~60% of AC patients to whom you would prescribe reproxalap	

MOA = Mechanism of action
AC = Allergic Conjunctivitis
Source: Physician market research completed by Aldeyra Therapeutics.

February 24, 2020

David McMullin, Chief Commercial Officer

Allergic Conjunctivitis Market Opportunity Q&A

Nasdaq: ALDX

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February 24, 2020

Todd Brady, M.D., President and CEO

Proliferative Vitreoretinopathy Patient Video

Nasdaq: ALDX

February 24, 2020

Todd Brady, M.D., President and CEO

Concluding Remarks

Nasdaq: ALDX

Our Lead Programs Represent Compelling Commercial Opportunities

Dry Eye Disease

Reproxalap 0.25%

Early and consistent symptom and sign improvements in clinical trials*

Broad symptom and sign improvements in clinical trials*

RENEW-Part 1 Phase 3 Completed December 2019

Allergic Conjunctivitis

Reproxalap 0.25%

Clinically significant and durable symptom response in allergen chamber trial

Active in post-histaminic allergy, for which no drug is approved

INVIGORATE Phase 3 Results H2 2020

Proliferative Vitreoretinopathy

ADX-2191

Potential therapeutic breakthrough for PVR
- ✓ U.S. orphan designation
- ✓ FDA fast track designation

Reattachment success and tolerability demonstrated in Phase 1b clinical trial**

GUARD Phase 3 - Part 1 Initiated December 2019

*DED Phase 2; RENEW-Part 1 Induction Maintenance regimen; DED Formulation Phase 2
**Open-label investigator sponsored Phase 1b clinical trial; results demonstrated over the study period

PVR = Proliferative vitreoretinopathy

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A New Paradigm for the Treatment of Immune-Mediated Diseases

Nasdaq: ALDX