

# Ocular Pharmacokinetics of OTX-DED, a Sustained-release Intracanalicular Insert Delivery Dexamethasone, in a Canine Model

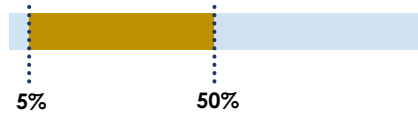
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# Disclosures

- This study was funded by Ocular Therapeutix, Inc.
- All authors are employees of Ocular Therapeutix, Inc.

# Unmet Needs in Dry Eye Therapy

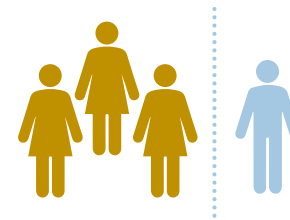
Dry eye disease (DED) is a multifactorial disorder of the tears and ocular surface and represents the most common reason for seeking medical eye care.<sup>1,2</sup>



Prevalence is estimated to be **5%** to **50%** of the global population<sup>2</sup>



**8.6 million** patients with episodic DED in the US are treated with prescription or over-the-counter therapies<sup>3</sup>



Prevalence increases with **age** and is 2-3 times higher in the **female** population compared to the male population<sup>4</sup>

**Inflammation plays a key role in DED and corticosteroids are well-established as a fast-acting and effective treatment for DED signs and symptoms,<sup>1,5</sup> however:**

- Abuse and long-term use of topical ophthalmic steroids can lead to IOP elevations and cataract formation<sup>6</sup>
- Use of topical ophthalmic steroids for DED is considered off-label (except for EYSUVIS™)<sup>7</sup>
- They may contain preservatives that can lead to corneal toxicity and further aggravate DED<sup>7-9</sup>

*A preservative-free, corticosteroid for the short-term treatment of DED signs and symptoms that eliminates the potential for patient abuse/misuse is needed*

# OTX-DED (Dexamethasone Intracanalicular Insert)

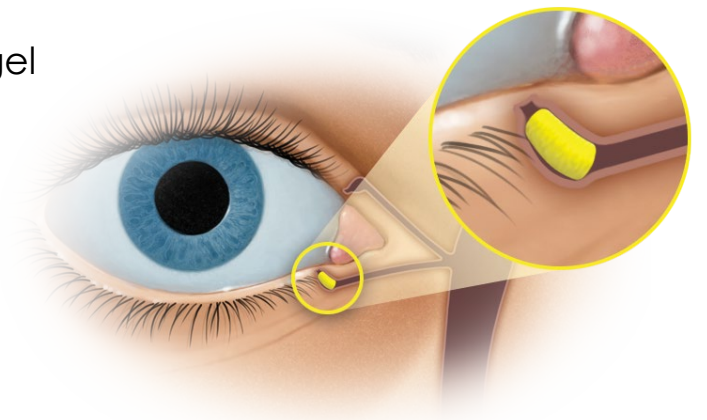
**OTX-DED is a novel, hydrogel-based, preservative-free, resorbable intracanalicular insert being evaluated for the short-term treatment of sign and symptoms of DED.**

**OTX-DED uses two common methods for treating dry eye disease:**

- Primarily provides anti-inflammatory therapy with a sustained and tapered delivery of dexamethasone
- Potentially aids tear conservation through punctal occlusion

## **Product Attributes**

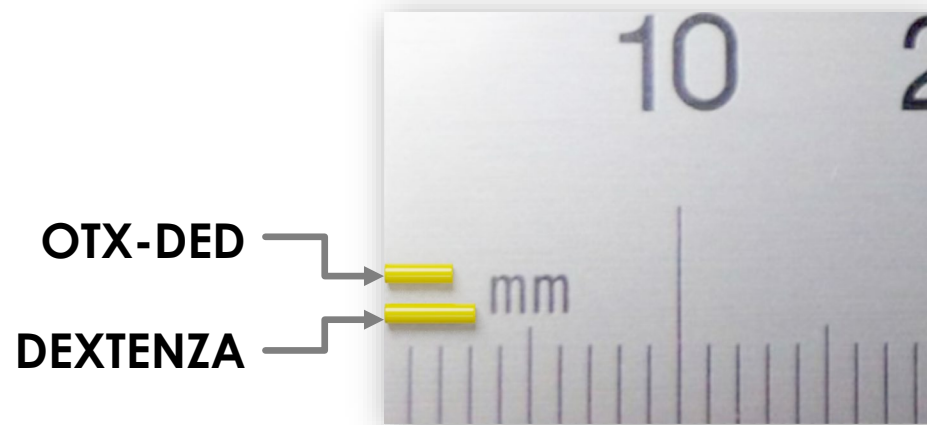
- Contains 0.2 or 0.3 mg of dexamethasone in a polyethylene glycol (PEG) hydrogel
- Designed to provide effective therapy for up to 2 to 3 weeks with a single insert
- Alternative to conventional steroid eye drops
- Occludes the punctum
- Free of antimicrobial preservatives
- Fully biodegradable
- Conjugated with fluorescein for visualization



*Rendering of placement of insert in the canaliculus*

# OTX-DED Physical Attributes

OTX-DED is shorter and contains less dexamethasone than DEXTENZA (dexamethasone ophthalmic insert) 0.4 mg



*DEXTENZA is a hydrogel-based, resorbable intracanalicular insert that delivers a 0.4 mg dose of dexamethasone for up to 30 days.<sup>1</sup>*

*DEXTENZA is indicated for the treatment of ocular inflammation and pain following ophthalmic surgery.<sup>1</sup>*

OTX-DED	Dimension	DEXTENZA <sup>2</sup>
0.2 or 0.3 mg	Dose of Dexamethasone	0.4 mg
2.14-2.36 mm	Dry Length	3 mm
0.2 mg: 0.41-0.49 mm 0.3 mg: 0.44-0.55 mm	Dry Diameter	~0.55 mm

# Study Objective and Methods

**Objective:** to characterize the ocular pharmacokinetics of dexamethasone released from OTX-DED 0.2 mg in a beagle dog model

## Methods:

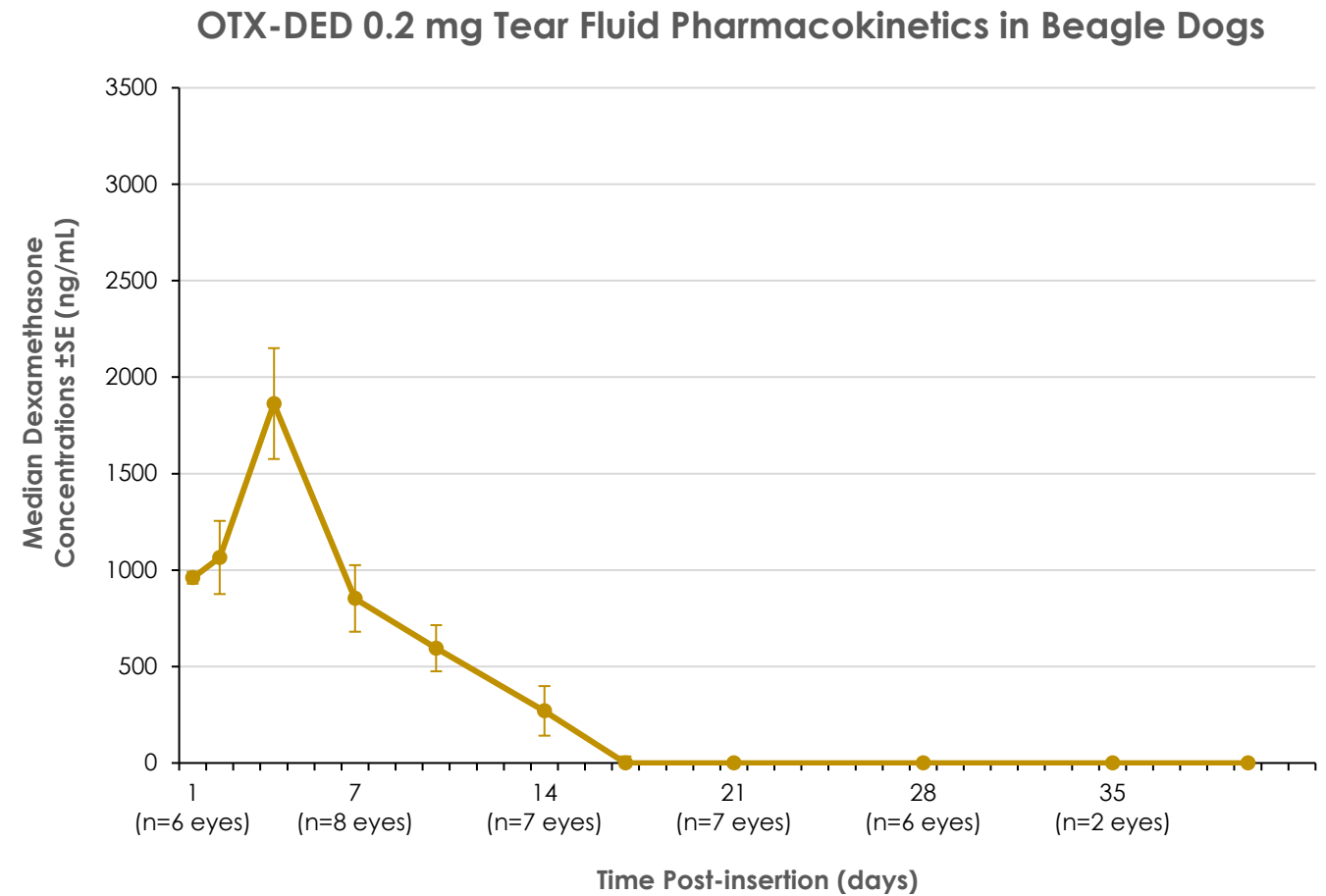
1. **OTX-DED 0.2 mg inserts placed bilaterally** into punctum of 7 beagles (14 eyes) on Day 0
2. **Tear fluid samples collected** with 10 mm Schirmer tear test strips on Days 1, 2, 4, 7, 10, 14, 17, 21, 28, 35, 37 and 42
3. **Tear fluid samples measured for dexamethasone concentrations** using liquid chromatography with tandem mass spectrometry



Example of Schirmer tear test strip with tear fluid

# OTX-DED 0.2 mg Tear Fluid Pharmacokinetic Profile

- OTX-DED pharmacokinetics demonstrated a sustained level of dexamethasone in the tear fluid through Day 7 followed by a tapering from Day 7 to 14 with complete release by Day 17
- OTX-DED has a shorter duration of release compared to DEXTENZA which releases over 28 days<sup>1</sup>



# Conclusions

- Topical ophthalmic corticosteroids are effective in treating DED, but are associated with side effects from patient abuse and long-term use
- OTX-DED combines two DED treatment modalities into a single physician-administered therapy:
  - Anti-inflammatory therapy with dexamethasone
  - Tear conservation with punctal occlusion
- In this study, a single OTX-DED 0.2 mg intracanalicular insert delivered dexamethasone to the ocular surface for approximately 14 days
  - Indicates shorter duration of dexamethasone release compared to DEXTENZA (released over 28 days)
- OTX-DED is currently being evaluated for the short-term treatment of the signs and symptoms of DED in a Phase 2 clinical trial