





	<a href="#">Timolol maleate eye drops, solution</a>		signsandsymptoms of ocular irritation including blepharitis*, keratitis*, decreased corneal sensitivity, and dry eyes*	visual disturbances including refractive changes (due to withdrawal of miotic therapy in some cases)*	ptosis, diplopia, choroidal detachment following filtration surgery* (see Special warning and precautions for use 4.4)	itching, tearing, redness, blurred vision, corneal erosion
Ear and labyrinth disorders	<a href="#">Timolol maleate eye drops, solution</a>				tinnitus*	
Cardiac disorders	<a href="#">Timolol maleate eye drops, solution</a>			bradycardia*	chest pain*, palpitation*, oedema*, arrhythmia*, congestive heart failure*, cardiac arrest*, heart block	atrioventricular block, cardiac failure
	<a href="#">Dorzolamide hydrochloride eye drops, solution</a>					Palpitations
Vascular disorders	<a href="#">Timolol maleate eye drops, solution</a>				hypotension*, claudication, Raynaud's phenomenon*, cold hands and feet*	
Respiratory, thoracic, and mediastinal disorders	<a href="#">COSOPT-S</a>		sinusitis		shortness of breath, respiratory failure, rhinitis, rarely bronchospasm	
	<a href="#">Dorzolamide hydrochloride eye drops, solution</a>				epistaxis*	Dyspnea
	<a href="#">Timolol maleate eye drops, solution</a>			dyspnoea*	bronchospasm (predominantly in patients with pre-existing bronchospastic disease)*, respiratory failure, cough*	
Gastrointestinal disorders	<a href="#">COSOPT-S</a>	dysgeusia				
	<a href="#">Dorzolamide hydrochloride eye drops, solution</a>		nausea*		throat irritation, dry mouth*	
	<a href="#">Timolol maleate eye drops, solution</a>			nausea*, dyspepsia*	diarrhoea, dry mouth*	dysgeusia, abdominal pain, vomiting
Skin and subcutaneous tissue disorders	<a href="#">COSOPT-S</a>				contact dermatitis, Stevens- Johnson syndrome, toxic epidermal necrolysis	
	<a href="#">Dorzolamide hydrochloride eye drops, solution</a>				rash*	
	<a href="#">Timolol maleate eye drops, solution</a>				alopecia*, psoriasiform rash or exacerbation of psoriasis*	skin rash
Musculoskeletal and connective tissue disorders	<a href="#">Timolol maleate eye drops, solution</a>				systemic lupus erythematosus	myalgia
Renal and urinary disorders	<a href="#">COSOPT-S</a>			urolithiasis		
Reproductive system and breast disorders	<a href="#">Timolol maleate eye drops, solution</a>				Peyronie's disease*, decreased libido	sexual dysfunction
General disorders and administration site conditions	<a href="#">Dorzolamide hydrochloride eye drops, solution</a>		asthenia/ fatigue*			
	<a href="#">Timolol maleate eye drops, solution</a>			asthenia/ fatigue*		

\*These adverse reactions were also observed with COSOPT (preserved formulation) during post-marketing experience.  
\*\*Additional adverse reactions have been seen with ophthalmic beta-blockers and may potentially occur with COSOPT-S.

#### 4.9 Overdose

No data are available in humans in regard to overdose by accidental or deliberate ingestion of COSOPT (preserved formulation) or COSOPT-S.

##### Symptoms

There have been reports of inadvertent overdoses with timolol maleate ophthalmic solution resulting in systemic effects similar to those seen with systemic beta-adrenergic blocking agents such as dizziness, headache, shortness of breath, bradycardia, bronchospasm, and cardiac arrest. The most common signs and symptoms to be expected with overdoses of dorzolamide are electrolyte imbalance, development of an acidotic state, and possibly central nervous system effects.

Only limited information is available with regard to human overdose by accidental or deliberate ingestion of dorzolamide hydrochloride. With oral ingestion, somnolence has been reported. With topical application the following have been reported: nausea, dizziness, headache, fatigue, abnormal dreams, and dysphagia.

##### Treatment

Treatment should be symptomatic and supportive. Serum electrolyte levels (particularly potassium) and blood pH levels should be monitored. Studies have shown that timolol does not dialyze readily.

### 5. PHARMACOLOGICAL PROPERTIES

#### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Antiglaucoma preparations and miotics, Beta blocking agents, Timolol, combinations, ATC code: S01ED51

##### Mechanism of action

COSOPT-S is comprised of two components: dorzolamide hydrochloride and timolol maleate. Each of these two components decreases elevated intraocular pressure by reducing aqueous humor secretion, but does so by a different mechanism of action.

Dorzolamide hydrochloride is a potent inhibitor of human carbonic anhydrase II. Inhibition of carbonic anhydrase in the ciliary processes of the eye decreases aqueous humor secretion, presumably by slowing the formation of bicarbonate ions with subsequent reduction in sodium and fluid transport. Timolol maleate is a nonselective beta-adrenergic receptor blocking agent. The precise mechanism of action of timolol maleate in lowering intraocular pressure is not clearly established at this time, although a fluorescein study and tonography studies indicate that the predominant action may be related to reduced aqueous formation.

However, in some studies a slight increase in outflow facility was also observed. The combined effect of these two agents results in additional intraocular pressure reduction (IOP) compared to either component administered alone.

Following topical administration, COSOPT-S reduces elevated intraocular pressure, whether or not associated with glaucoma. Elevated intraocular pressure is a major risk factor in the pathogenesis of optic nerve damage and glaucomatous visual field loss. This medicinal product reduces intraocular pressure without the common side effects of miotics such as night blindness, accommodative spasm and pupillary constriction.

##### Pharmacodynamic effects

###### Clinical Effects

Clinical studies of up to 15 months duration were conducted to compare the IOP-lowering effect of COSOPT (preserved formulation) b.i.d. (dosed morning and bedtime) to individually- and concomitantly-administered 0.5% timolol and 2.0% dorzolamide in patients with glaucoma or ocular hypertension for whom concomitant therapy was considered appropriate in the trials. This included both untreated patients and patients inadequately controlled with timolol monotherapy. The majority of patients were treated with topical beta- blocker monotherapy prior to study enrollment. In an analysis of the combined studies, the IOP-lowering effect of COSOPT (preserved formulation) b.i.d. was greater than that of monotherapy with either 2% dorzolamide i.i.d. or 0.5% timolol b.i.d. The IOP-lowering effect of COSOPT (preserved formulation) b.i.d. was equivalent to that of concomitant therapy with dorzolamide b.i.d. and timolol b.i.d. The IOP-lowering effect of COSOPT (preserved formulation) b.i.d. was demonstrated when measured at various time points throughout the day and this effect was maintained during long-term administration.

In an active-treatment-controlled, parallel, double-masked study in 261 patients with elevated intraocular pressure ≥22 mmHg in one or both eyes, COSOPT-Shad an IOP-lowering effect equivalent to that of COSOPT (preserved formulation). The safety profile of COSOPT-S was similar to COSOPT (preserved formulation).

##### Paediatric population

A 3 month controlled study, with the primary objective of documenting the safety of 2% dorzolamide hydrochloride ophthalmic solution in children under the age of 6 years has been conducted. In this study, 30 patients under 6 and greater than or equal to 2 years of age whose IOP was not adequately controlled with monotherapy by dorzolamide or timolol received COSOPT (preserved formulation) in an open label phase. Efficacy in those patients has not been established. In this small group of patients, twice daily administration of COSOPT (preserved formulation) was generally well tolerated with 19 patients completing the treatment period and 11 patients discontinuing for surgery, a change in medication, or other reasons.

#### 5.2 Pharmacokinetic properties

##### Dorzolamide Hydrochloride

Unlike oral carbonic anhydrase inhibitors, topical administration of dorzolamide hydrochloride allows for the active substance to exert its effects directly in the eye at substantially lower doses and therefore with less systemic exposure. In clinical trials, this resulted in a reduction in IOP without the acid-base disturbances or alterations in electrolytes characteristic of oral carbonic anhydrase inhibitors.

When topically applied, dorzolamide reaches the systemic circulation. To assess the potential for systemic carbonic anhydrase inhibition following topical administration, active substance and metabolite concentrations in red blood cells (RBCs) and plasma and carbonic anhydrase inhibition in RBCs were measured. Dorzolamide accumulates in RBCs during chronic dosing as a result of selective binding to CA-II while extremely low concentrations of free active substance in plasma are maintained. The parent active substance forms a single N-desethyl metabolite that inhibits CA-II less potently than the parent active substance but also inhibits a less active isoenzyme (CA-I). The metabolite also accumulates in RBCs where it binds primarily to CA-I. Dorzolamide binds moderately to plasma proteins (approximately 33%).

Dorzolamide is primarily excreted unchanged in the urine; the metabolite is also excreted in urine. After dosing ends, dorzolamide washes out of RBCs nonlinearly, resulting in a rapid decline of active substance concentration initially, followed by a slower elimination phase with a half-life of about four months.

When dorzolamide was given orally to simulate the maximum systemic exposure after long term topical ocular administration, steady state was reached within 13 weeks. At steady state, there was virtually no free active substance or metabolite in plasma; CA inhibition in RBCs was less than that anticipated to be necessary for a pharmacological effect on renal function or respiration. Similar pharmacokinetic results were observed after chronic, topical administration of dorzolamide hydrochloride. However, some elderly patients with renal impairment (estimated CrCl 30-60 ml/min) had higher metabolite concentrations in RBCs, but no meaningful differences in carbonic anhydrase inhibition and no clinically significant systemic side effects were directly attributable to this finding.

##### Timolol Maleate

In a study of plasma active substance concentration in six subjects, the systemic exposure to timolol was determined following twice daily topical administration of timolol maleate ophthalmic solution 0.5%. The mean peak plasma concentration following morning dosing was 0.46 ng/ml and following afternoon dosing was 0.35 ng/ml.

#### 5.3 Preclinical safety data

The ocular and systemic safety profile of the individual components is well established.

##### Dorzolamide

In rabbits given maternotoxic doses of dorzolamide associated with metabolic acidosis, malformations of the vertebral bodies were observed.

##### Timolol

Animal studies have not shown teratogenic effect.

Furthermore, no adverse ocular effects were seen in animals treated topically with dorzolamide hydrochloride and timolol maleate ophthalmic solution or with concomitantly-administered dorzolamide hydrochloride and timolol maleate. *In vitro* and *in vivo* studies with each of the components did not reveal a mutagenic potential. Therefore, no significant risk for human safety is expected with therapeutic doses of COSOPT-S.

### 6. PHARMACEUTICAL PARTICULARS

#### 6.1 List of excipients

Hydroxyethylcellulose  
Mannitol (E421)  
Sodium citrate (E331)  
Sodium hydroxide (E524) for pH adjustment  
Water for injection

#### 6.2 Incompatibilities

Not applicable.

#### 6.3 Shelf life

3 years.

COSOPT-S should be used no longer than one month after first opening the pouch. Discard any unused single dose containers after that time.

Discard the opened single dose container immediately after first use.

#### 6.4 Special precautions for storage

Do not store above 30°C.

Store in the original package in order to protect from light.

#### 6.5 Nature and contents of container

COSOPT-S is available in 0.2 ml low density polyethylene single dose containers in an aluminum pouch containing 20 single-dose containers.

Pack sizes:

60 x 0.2 ml (3 pouches with 20 single dose containers)

#### 6.6 Special precautions for disposal and other handling

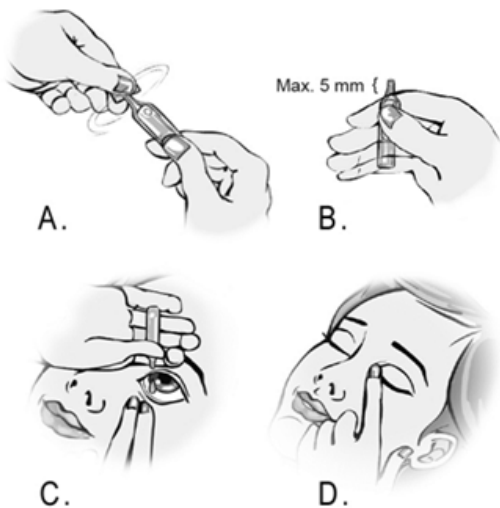
No special requirements.

**Do not allow the single-dose container to touch the eye or areas around the eye.** It could cause injury to your eye. It may also become contaminated with bacteria that can cause eye infections leading to serious damage of the eye, even loss of vision. To avoid contamination of the eye drop solution, a new single-dose container should be opened immediately prior to each use; there is enough solution in each container for both eyes if your doctor has told you to use the drops in both eyes.

Discard the opened container with any remaining contents immediately after use.

##### Instructions for use

Open the foil pouch which contains the individual single-dose containers. Write the date of first opening on the pouch.



1. Wash your hands.

2. Take the strip of containers from the pouch.
3. Detach one single-dose container from the strip.
4. Put the remaining strip back in the pouch and fold the edge to close the pouch.
5. To open the container, twist off the tab. (Picture A).
6. Hold the container between your thumb and index finger. Note that the tip of the container must not show more than 5 mm above the edge of your index finger. (Picture B).
7. Tilt your head backwards or lie down. Place your hand on your forehead. Your index finger should be aligned with your eyebrow or resting on the bridge of the nose. Look up. Pull the lower eyelid downwards with the other hand. **Do not allow any part of the container to touch your eye or any area around your eye.** Gently squeeze the container to let one drop fall into the space between the lid and the eye. (Picture C). Do not blink while applying the drop to your eye. Each single-dose container contains enough solution for both eyes.
8. Close your eye and press the inner corner of the eye with your finger for about two minutes. This helps to stop the medicine from getting into the rest of the body. (Picture D).
9. Wipe off any excess solution from the skin around the eye

**If your doctor has told you to use drops in both eyes**, repeat steps 7 to 9 for your other eye.

After putting the drop into the eye(s), throw away the used single-dose container even if there is solution remaining to avoid contamination of the preservative free solution.

Store the remaining containers in the foil pouch; the remaining containers must be used within one month after opening of the pouch. If there are any containers left one month after opening the pouch they should be safely thrown away and a fresh pouch opened. It is important to continue to use the eye drops as prescribed by your doctor.

If you are not sure how to administer your medicine, ask your doctor, pharmacist or nurse.

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