



# Ophthalmology - Optometry

As the saying goes, the eyes are the windows to the soul, but they also serve the important function of allowing us to look out on to the world around us and experience all there is to see. There are two fields of medicine that deal specifically with the eyes: ophthalmology and optometry. Ophthalmology deals primarily with diseases (such as pink eye) of the visual pathways between the eyes and brain. Optometry concerns itself with vision problems (such as farsightedness and nearsightedness). Many people visit an optometrist once a year to make sure that their vision is functioning properly and that their eyes are healthy. Ophthalmologists are generally only sought for the treatment of eye problems broader than those just concerning vision.

### Conjunctivitis (Pink Eye)

The conjunctiva is the transparent lining on the inside of the eyelids. Commonly a virus, bacteria, or allergic reaction will cause this lining to become infected, a condition known as conjunctivitis. The white part of the eye may start to look pink from the inflammation, hence the term “pink eye.” Other symptoms include thick discharge from the eye (usually yellow, white or green, depending on the cause of the infection), itchiness, blurred vision, and the feeling that there is something scratching underneath the eyelid that will not go away. Conjunctivitis usually does not have any long-term side effects, but it is quite unpleasant (as well as contagious), so immediate treatment is recommended.

	COMPANY	PRODUCT	PHASE
Conjunctivitis	InSite Vision Incorporated	AzaSite (azithromycin) / ISV-401	PA
	Santen Incorporated	Alamast / Alegysal (pemirolast potassium)	M
	Santen Incorporated	Quixin (levofloxacin)	M

### Corneal Ulcers

The cornea, the clear front part of the eye through which light passes, is subject to infections, and injury from exposure and foreign objects. Infection and injury can cause inflammation of the cornea—a condition called keratitis. Tissue loss because of inflammation produces an ulcer. The ulcer can either be centrally located, thus greatly affecting vision, or peripherally located. There are about 30,000 cases of bacterial corneal ulcers in the United States each year.

	COMPANY	PRODUCT	PHASE
Corneal Ulcers	Santen Incorporated	Iquix (levofloxacin)	A

### Diabetic Macular Edema

Diabetic macular edema occurs when fluid and protein deposits collect on or under the macula (an oval yellow spot near the center of the retina of the human eye of the eye responsible for high acuity vision), causing it to thicken and swell. The swelling may distort a person’s central vision, as the macula is near the center of the retina at the back of the eyeball. It provides sharp, clear central vision that allows a person to see form, color, and detail that is directly in the line of sight. Treatments seek to reduce the swelling of the eye, thus reducing distorted vision.

	COMPANY	PRODUCT	PHASE
Diabetic Macular Edema	Genentech, Inc.	Lucentis (ranibizumab)	II
	Nektar Therapeutics	Macugen (pegaptanib sodium)	III

### Dry Eye

Dry eye occurs when the tear ducts located in the eyes do not produce enough tears to adequately lubricate the eyes. This can lead to dry, itchy, stinging eyes that get worse as the day progresses. Causes include old age, arthritis, lupus, diabetes, and environmental factors (such as weather). Treatment involves eye drops that are able to re-wet the surface of the eye, making the patient much more comfortable. Avoiding external irritants such as chemicals, pollens and air conditioning may also provide temporary relief.

COMPANY	PRODUCT	PHASE	
Nascent Pharmaceuticals, Inc.	iDESTRIN (NP50301)	II	Dry Eyes
InSite Vision Incorporated	AquaSite	M	
TheraLife	TheraLife eye	M	
TheraLife	TheraLife eye enhanced	M	
TheraLife	TheraLife eye starter	M	
TheraLife	TheraLife eye enhanced starter	M	

### Glaucoma

Glaucoma is a disease of the eye that results in a loss of vision, usually caused by high intraocular pressure (IOP), or pressure within the eye. There is a small space at the front (anterior) of the eye called the anterior chamber, which is filled with a clear fluid. The fluid nourishes the tissues around it, so it is constantly being replenished, which means it also needs to drain out the chamber. In the case of glaucoma, the fluid is not able to drain properly, and the build-up of fluid causes an increase in IOP. The high pressure causes damage to the optic nerve, which is the nerve that sends signals from the eye to the brain and gives us sight. It is the damage to the optic nerve that steals sight from people with glaucoma.

Diabetics, African Americans, and those with a family history of glaucoma are more at risk. Glaucoma is not curable, nor is the damage reversible. However, medications (especially those that reduce pressure in the eye) can slow its progression and the loss of vision. About 3 million people in the United States are estimated to have glaucoma, though only about half of them have been diagnosed.

COMPANY	PRODUCT	PHASE	
InSite Vision Incorporated	ISV-205	II	Intraocular Hypertension
InSite Vision Incorporated	BetaSite / levobunolol	III	Glaucoma
Santen Incorporated	Betimol (timolol hemihydrate)	M	Intraocular Hypertension

### Macular Degeneration

Most vision loss in people over the age of 55 is due to macular degeneration, a condition that affects 10 million Americans. Because the condition usually develops in older adults, it is generally referred to as age-related macular degeneration (ARMD).

The retina is a thin layer of cells in the back of the eye. Like a movie screen, images of what we see around us are projected onto the retina. The retina communicates the information about what we are seeing to the optic nerve, which in turn sends the message to the brain. The macula is the center most part of the retina. Degeneration (damage) of these cells is like slowly bringing the center of the screen out of focus, sometimes blacking it out completely.

There are two types of ARMD: dry and wet. Dry ARMD occurs when the cells of the macula simply begin to break down. This process is usually slow and results in a blurred spot in the center of the field of vision. Wet ARMD is rarer than the dry form, but the results are much worse. It occurs when blood vessels behind the retina begin leaking blood and fluid behind the

macula. Imagine a pocket behind the middle of a movie screen filling with fluid; as the space fills, the screen would change shape, causing straight lines to appear curved and the picture to blur. This is similar to the distortion that occurs as wet ARMD causes the macula to lift. Usually, vision is eventually lost completely. Once it is gone, sight cannot be restored; however, by recognizing ARMD early, treatment may help slow the loss of vision.

	COMPANY	PRODUCT	PHASE
<b>Macular Degeneration</b>	<b>Genentech, Inc.</b>	Lucentis (ranibizumab) with Visudyne (verteporfin)	II
	<b>Miravant Medical Technologies</b>	Photrex	PA
	<b>Genentech, Inc.</b>	Lucentis (ranibizumab)	M
	<b>Nektar Therapeutics</b>	Macugen (pegaptanib sodium)	PM





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