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Allergies and the Eyes

Approximately 22 million people in the United States suffer from seasonal itchy, swollen, red eyes. Airborne allergens, such as house dust, animal dander, and mold, constantly bombard the eyes and can cause ocular allergies at any time. But when spring rolls around and the plant pollen starts flying, it seems as if almost everyone starts crying.

Seasonal allergic conjunctivitis, or hay fever, is the most common allergic eye problem. Various antihistamine and decongestant eyedrops and sprays can soothe your irritated eyes and nose.

Make every effort to avoid allergens. An allergist can help determine what you are allergic to so you can stay away from it. Staying away from outdoor pollen may be impossible, but remaining indoors in the morning when the outdoor pollen levels are highest may help control symptoms. If you are allergic to house dust, open the windows and keep household filters clean.

Applying cool compresses to the eyes helps decrease swelling and itching. Artificial tears dilute the allergens and form a protective barrier over the surface of the eye. Avoid rubbing the eyes, which makes symptoms worse.

If seasonal allergic conjunctivitis is a problem, see an ophthalmologist (Eye M.D.). Your ophthalmologist can prescribe several safe and effective anti-allergy drops. In some cases, oral medications are needed. Your ophthalmologist can also make sure that your symptoms are not being caused by a more serious problem.



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Anesthesia—Conscious Care Sedation

Conscious care sedation is a technique that minimizes pain and anxiety during minor surgical procedures while keeping you conscious, able to respond to verbal commands, and able to breathe without assistance.

With conscious care sedation, your central nervous system is depressed using intravenous, inhalation, or oral sedatives, or a combination of these approaches.

After conscious care sedation, you may not remember all or part of the procedure, and you may experience headache, nausea, and vomiting. You will be monitored closely immediately following your procedure, and should not drive or operate dangerous equipment for a day afterward.



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Anesthesia—General

During surgery, an anesthesiologist will put you to sleep so that you do not experience any pain. The combination of drugs and/or gases that puts you to sleep and prevents pain is called general anesthesia.

Anesthetic medications are usually delivered through an IV in your arm or hand. Once you fall asleep, you will not be aware of anything until you wake up after surgery. Once asleep, your anesthesiologist may put a tube in your airway and put you on a respirator to help you breathe and to deliver additional anesthetics. Monitors will record your blood pressure, heart rate, and oxygen concentration, and your anesthesiologist will make sure your lungs, kidneys and heart are functioning well.

When you awaken after surgery, the tube in your throat will be removed and you will be watched in the recovery room until you are fully alert.

General anesthesia is very safe, but there are some risks. You could have an allergic reaction to the anesthesia, and you may experience nausea and vomiting following surgery. There are also small risks of lung infection, heart attack, and stroke. You can help prevent these risks by telling your doctor about any allergies you have, about all the medications you take, and about all your medical conditions. Also, be sure to tell your doctor if you or anyone in your family has ever experienced problems with anesthesia in the past.



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Anesthesia—Intracameral

Today, many surgeries of the eye can be performed using minimally invasive techniques that allow your ophthalmologist (Eye M.D.) to give you topical anesthetics with eyedrops rather than injectable anesthetics before your surgical procedure.

In some cases, your comfort during surgery may be increased by giving you an additional anesthetic during surgery by injecting it into your already numbed eye. This is called **intracameral anesthesia**.

Intracameral anesthesia ensures that your surgical procedure is as comfortable as possible, and as it is administered after you have received topical anesthetics, patients generally experience little if any discomfort due to the injection.



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Anesthesia—Monitored Anesthesia Care

Monitored anesthesia care (MAC) is a technique that minimizes pain and anxiety during surgical procedures. With MAC, you are not fully sedated as you would be under general anesthesia. The anesthesiologist will administer intravenous (IV) medication in your arm or hand. You will probably be in a light, sleeplike state and may wake up occasionally during the surgery. You will breathe on your own and will not need the help of a ventilator. The anesthesiologist will monitor you just as if you were undergoing general anesthesia, checking your vital signs, maintaining your airway, and continually evaluating your vital functions.

After MAC, you may not remember any of the procedure, and you may experience headache, nausea, and vomiting. You will be monitored closely immediately following your procedure. Depending on your doctor's instructions, you may stay in the hospital overnight for close monitoring or you may be discharged. If you are released the day of the procedure, you should not drive, operate dangerous equipment, make any major decisions, or sign any legal documents for a day afterward.



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Anesthesia—Peribulbar

Today, many surgeries of the eye can be performed using techniques that allow your ophthalmologist (Eye M.D.) to use injectable anesthetics to completely numb your eye before your surgical procedure rather than putting you to sleep using general anesthesia.

Peribulbar anesthesia is the injection of a local anesthetic around the eye that completely numbs the eye. First, your ophthalmologist applies a topical anesthetic to numb the injection site on your lower eyelid. Then, the ophthalmologist inserts a needle under your eyeball and injects a local anesthetic. In some cases, a second injection is required at another site. Your eye is completely numb, and you feel no pain during surgery. The anesthetic also immobilizes your eye so that your ophthalmologist can perform your surgery quickly and easily.

By using peribulbar anesthesia, your ophthalmologist ensures that you are as comfortable as possible during and following surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day.

Though very safe, there are some risks associated with peribulbar anesthesia, as there are with most medical procedures. These risks are due to the anesthetic, as well as to the injection procedure itself. These risks include hemorrhage in the eye socket, perforation of the eyeball, and damage to the optic nerve. Should you experience any complications due to this procedure, it is possible that your doctor will have to cancel and reschedule your surgery.



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Anesthesia—Regional

Regional anesthesia is a type of procedure that eliminates the pain associated with eye surgery.

Instead of undergoing general anesthesia and being unconscious for your surgery, your eye is numbed with eyedrops and your ophthalmologist (Eye M.D.) gives you an injection that often immobilizes your eye as well as blocks any pain associated with your surgical procedure.

By using regional anesthesia, your ophthalmologist ensures that you are as comfortable as possible during and following surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day. Also, you may not experience some of the potential side effects of general anesthesia, such as nausea and vomiting.

Though very safe, there are some risks associated with regional anesthesia, as there are with most medical procedures. These risks are due to the anesthetic, as well as to the injection procedure itself. These risks include hemorrhage in the eye socket, perforation of the eyeball, and damage to the optic nerve. Should you experience any complications due to this procedure, it is possible that your doctor will have to cancel and reschedule your surgery.



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Anesthesia—Retrobulbar

Today, many surgeries of the eye can be performed using techniques that allow your ophthalmologist (Eye M.D.) to use injectable anesthetics to completely numb your eye before your surgical procedure rather than putting you to sleep using general anesthesia.

Retrobulbar anesthesia is the injection of a local anesthesia behind the eye that completely numbs the eye. First, your ophthalmologist applies a topical anesthetic to numb the injection site on your lower eyelid. Then, the ophthalmologist inserts a needle under your eyeball and injects a local anesthetic behind your eye. This completely numbs your eye so that you will feel no pain during surgery. It also immobilizes your eye so that your ophthalmologist can perform your surgery quickly and easily.

By using retrobulbar anesthesia, your ophthalmologist ensures that you are as comfortable as possible during and following surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day. Because this anesthetic affects your optic nerve, you will not be able to see out of your eye during surgery. It is possible that following surgery you will experience a brief period of vision loss due to the anesthetic. This is temporary, and your vision will quickly return.

Though very safe, there are some risks associated with retrobulbar anesthesia, as there are with most medical procedures. These risks are due to the anesthetic, as well as to the injection procedure itself. These risks include hemorrhage in the eye socket, perforation of the eyeball, and damage to the optic nerve. Should you experience any complications due to this procedure, it is possible that your doctor will have to cancel and reschedule your surgery.



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Anesthesia—Subconjunctival

Today, many surgeries of the eye can be performed using techniques that allow your ophthalmologist (Eye M.D.) to use injectable anesthetics to completely numb your eye before your surgical procedure rather than putting you to sleep using general anesthesia.

Subconjunctival anesthesia is the injection of a local anesthetic that completely numbs the eye. First, your ophthalmologist may provide you with a mild sedative through an IV before surgery to make the injection more comfortable. Then, the ophthalmologist inserts a needle beneath your conjunctiva, which is a thin skin covering the white portion of your eye, and injects a local anesthetic. This completely numbs your eye so that you will feel no pain during surgery. It also partially immobilizes your eye so that your ophthalmologist can perform your surgery quickly and easily.

By using subconjunctival anesthesia, your ophthalmologist ensures that you are as comfortable as possible during surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day.



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Anesthesia—Subtenons

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Subtenons anesthesia is the injection of a local anesthetic that completely numbs the eye. First, you are given eyedrops to numb the eye and make the injection more comfortable. Then, your ophthalmologist snips your **conjunctiva**, the thin skin covering the white portion of the eye, and injects a local anesthetic deep underneath a membrane (called the **Tenon's membrane**) that envelops the eye. The anesthetic travels all around your eyeball, completely numbing your eye so that you feel no pain during surgery.

By using subtenons anesthesia, your ophthalmologist ensures that you are as comfortable as possible during surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day.



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Anesthesia—Topical

A topical anesthetic is one that is applied directly to the surface of your eye and affects only the area to which it is applied. Topical anesthesia is usually given in the form of eyedrops or gels, or applied with sponges to the surface of the eye.

In some cases, if surgery time will be relatively short, you may only require topical anesthesia. If this is the case, anesthetic drops or gel will be applied to your eye and you will need to follow your ophthalmologist's (Eye M.D.'s) instructions during the surgery to keep eye movement to a minimum. If you need to sneeze or shift position, you will simply need to alert your ophthalmologist beforehand.

Often, if surgery is longer or more involved, the topical anesthetic will be supplemented with other forms of anesthesia to make you more comfortable and perhaps to immobilize your eye.

By using topical anesthesia, your ophthalmologist ensures that you are as comfortable as possible during and following surgery. Since you will not be put to sleep using general anesthesia, your recovery time after surgery will be much quicker, and you will be able to go home the same day. There are usually few side effects or complications due to topical anesthesia.

Color Vision

Color blindness (color vision deficiency) is a condition in which certain colors cannot be detected. There are two types of color vision difficulties: congenital (inherited) problems that you have at birth, and problems that develop later in life.

People born with color vision problems are unaware that what they see is different from what others see unless it is pointed out to them. People with acquired color vision problems are aware that something has gone wrong with their color perception.

Congenital color vision defects usually pass from mother to son. These defects are due to partial or complete lack of the light-sensitive photoreceptors (cones) in the retina, the layer of light-sensitive nerve cells lining the back of the eye. Cones distinguish the colors red, green, and blue through visual pigment present in the normal human eye. Problems with color vision occur when the amount of pigment per cone is reduced, or one or more of the three cone systems are absent. This limits the ability to distinguish between greens and reds, and occasionally blues. It involves both eyes equally and remains stable throughout life.

There are different degrees of color blindness. Some people with mild color deficiencies can see colors normally in good light but have difficulty in dim light. Others cannot distinguish certain colors in any light. In the most severe form of color blindness, everything is seen in shades of gray.

Except in the most severe form, color blindness does not affect the sharpness of vision at all. It does not correlate with low intelligence or learning disabilities.

Most color vision problems that occur later in life are a result of disease, trauma, toxic effects from drugs, metabolic disease, or vascular disease. Color vision defects from disease are less understood than congenital color vision problems. There is often uneven involvement of the eyes and the color vision defect will usually be progressive. Acquired color vision loss can be the result of damage to the retina or optic nerve.

There is no treatment for color blindness. It usually does not cause any significant disability. However, it can prevent employment in an increasing number of occupations.

Change in color vision can signify a more serious condition. Anyone who experiences a significant change in color perception should see an ophthalmologist (Eye M.D.).



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Complete Eye Examination

A complete eye examination does more than determine how clearly you see from a distance and which lens prescription, if necessary, will give you the best possible vision. Your ophthalmologist (Eye M.D.) will also run a number of tests to check the health and function of your entire eye.

If you have never had an eye examination or are seeing a new ophthalmologist, your doctor or a technician will begin by asking you questions about your medical history, your family's medical history, and any vision problems you may have. If you wear contact lenses, be sure to bring them with you to your appointment. Your ophthalmologist will check them to make sure that they are the correct prescription, fit, and kind of lens for your eyes.

A complete eye examination will include many or all of these painless tests:

A **visual acuity test** measures how well you can see from a distance. Covering one eye at a time, you will look at an eye chart and be asked to identify letters that get smaller as you read farther down the chart.

If your visual acuity test indicates that you need corrective lenses, you will be given a **refraction test** to determine the correct prescription. Your ophthalmologist may use **retinoscopy** to estimate your prescription by shining a light into your eyes to see the movement of the light reflected by your retina. Your ophthalmologist will finalize your prescription by asking you to look through a device called a **phoropter** that has many different lenses in it. You will be asked to compare a series of two lens choices and evaluate which lens combination provides you with your best possible vision correction.

To test the function of your **eye muscles**, your ophthalmologist will have you follow the movement of an object in many directions, looking for weak muscles or poor control of the muscles that move your eyes.

To test your peripheral vision, which is what you are able to see to the sides of your visual field when you look straight ahead, your ophthalmologist uses a **visual field test**. You may be asked to cover one eye at a time and, while looking straight ahead, tell your ophthalmologist when you can see his or her hand or other object as it moves inward from outside your visual field. Or a computer

program may be used to test your visual field. If so, you will look straight ahead into a special device, often a lighted bowl-shaped instrument, and press a button each time you see a flash of light. Your ophthalmologist can use your responses to see if there are any blind spots in your visual field.

Your ophthalmologist will use a **slit-lamp microscope** to examine the front part of your eye, including the cornea, iris, and lens. You will sit at the slit lamp, which greatly magnifies your eye and shines a bright line of light into it, allowing your ophthalmologist to examine your eye closely. Before the test, you may be given eyedrops with fluorescein, an orange dye, to make your cornea easier to see. This dye will wash away naturally.

To test for glaucoma, a disease that can cause blindness when too much pressure in your eye damages the optic nerve, your ophthalmologist will use a **tonometer** to measure your intraocular pressure.

Using one method, **noncontact tonometry**, you will sit with your chin and forehead resting comfortably on the guides of a device that will blow a puff of air into your eye and thereby measure your eye pressure.

Applanation tonometry is another option. Your ophthalmologist will give you eyedrops containing an anesthetic and fluorescein dye to numb the front surface of your eye and will then use a manual tonometer to gently touch your cornea and measure the force required to flatten it. This procedure is quick and painless, and the anesthetic will wear off in 15 or 20 minutes.

Your ophthalmologist may also use **pachymetry** to measure the thickness of your cornea, which helps evaluate the accuracy of your intraocular pressure measurement. After applying numbing eyedrops, your ophthalmologist will use ultrasonic waves to measure your corneal thickness. This test is also a critical component of evaluating a patient's candidacy for LASIK surgery.

A **retinal examination** explores the back of your eye including the retina and optic nerve. First, depending on the type of retinal examination your ophthalmologist chooses, your pupils will be dilated with eyedrops, which may sting briefly. If your ophthalmologist chooses to use **direct examination**, he or she will shine a light in your eye and use a device called an ophthalmoscope to look at the back of your eye. Alternatively, using a method called **indirect examination**, your ophthalmologist may use a much brighter light mounted on his or her forehead to examine your eye while holding it open. Finally, to get the best look at the back of the eye, your ophthalmologist may choose to perform a **slit-lamp examination**, which combines the use of the slit lamp and special lenses. Retinal examinations usually take about five minutes, but the eyedrops will continue to blur your vision for several hours. You may not be able to drive and will be sensitive to bright light, but this is temporary and should resolve in several hours.

Computer Screens

Complaints of eye discomfort and fatigue are becoming more common as the use of computer screens increases. While it is true that computer screens can cause eyestrain, there is no convincing evidence that they can harm the eyes.

Some people fear that computer screens emit damaging ultraviolet (UV) light or radiation. The amount of UV light emitted by computer screens is a fraction of what is emitted from a fluorescent light. Radiation levels from computer screens are so low that a lifetime of exposure will not damage the eyes. After prolonged use of a computer screen, black and white objects may appear colored, but this is not a sign of eye damage.

Symptoms of eyestrain are eye irritation (red, watery, or dry eyes), eye fatigue (tired, aching heaviness of the eyelids or forehead), difficulty in focusing, and headaches. However, eyestrain does not result in permanent eye damage.

Eyestrain, backache, and muscle spasms may improve with proper arrangement of the computer screen and seating area. The Occupational Safety and Health Administration (OSHA) provides helpful suggestions on workstation arrangement.

It is important to wear appropriate eyeglasses adjusted for the distance between the eyes and the computer screen. Most computer users prefer to position the screen farther from where they normally read. Prescription eyeglasses should be adjusted accordingly.

Take periodic rest breaks. Using a computer requires unchanging body, head, and eye positions that can be fatiguing. Lubricate the eyes by blinking frequently or using artificial tears (lubricating eyedrops). Keep workstations clean to minimize eye irritation from dust.

Minimize light glare by adjusting office lights or using hoods or filters on the video screen. Standard office lighting is too bright for comfortable computer screen viewing.