CATARACTS FOR BEGINNERS
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Most people have heard of cataracts. Many people have a friend or relative who has had cataract surgery and know something about them from the patient’s perspective. In spite of this, many people do not know quite what a cataract is and will confuse one with other ocular problems such as glaucoma or macular degeneration. However, because patients feel that they should know about them already, they are often reluctant to ask the doctor questions. Therefore, it is important that optometric staff understand cataracts and are able to explain them to patients and their families. This course will address questions frequently asked by patients.

What is a cataract?
A cataract is any opacity (loss of transparency) of the lens inside the eye. Some cataracts are very small imperfections that cause no difference in vision and can go undetected for decades. Other cataracts are so cloudy and include so much of the lens that the patient’s pupil looks white and is noticeable to anyone who sees the patient.

Basic Anatomy
The lens is located directly behind the pupil and is in the front part of the eye. It is suspended in place by fibers called zonules that attach to the ciliary body. The center of the lens is called the nucleus. The outer part of the lens is the cortex. The lens is surrounded by a layer of tissue called the capsule.
Will the doctor check for cataracts?

Checking for cataracts is part of almost every eye exam. Every patient who comes in for a comprehensive eye exam will have his or her lenses examined for cataracts. Additionally, the doctor will look at the lenses of most patients who are in for office visits. Unless their chief complaint is blurry vision, the doctor may not be specifically looking for cataracts. But as the doctor will probably look at or through the lens, any significant cataract will still be found.

Symptoms of cataract

Because the lens does not have any pain receptors, pain is seldom a symptom of a cataract. The symptoms that patients will notice are usually a decrease in their clarity of vision and an increase in problems with glare. Sometimes patients will just complain about problems in low-light situations such as twilight and candlelight. Remember, a cataract is a loss in transparency of the lens and less light is getting through. Additionally most cataracts are irregular (like shower glass) and change how light passes through the eye. This causes the blurry vision, light scatter and increased glare.

Do I need to have my eyes dilated?

Many cataracts can be seen through an undilated pupil. In fact, the most visually significant cataracts are blocking light for the patient in their normal, undilated state. However, some cataracts cannot be seen without dilation, and all cataracts are easier to examine when the pupils are bigger.

Types of cataract

Cataracts are usually classified by their location in the lens. A nuclear cataract is located in the center part of the lens. These are usually yellowish in color and commonly occur with aging. They are often relatively uniform throughout the center of the lens. A cortical cataract is located in the cortex of the lens. These cataracts usually just cover part of the cortex and are often wedge-shaped and referred to as spokes. If these spokes are in the far periphery of the lens, they may be difficult, if not impossible, to see without dilation. Peripheral cataracts have minimal effects on vision because they are behind the iris most of the time. Posterior subcapsular cataracts (PSCs) are located on the back of the lens. As they tend to be in the middle of the pupil, they usually have a large impact on vision. There are also other less common cataracts, such as anterior subcapsular or capsular.

Who gets cataracts?

Patients of any age may have cataracts. Congenital cataracts are lens opacities that are already present at birth. These cataracts may have an intrauterine cause or may be hereditary. Some intrauterine causes are maternal infections, such as rubella or toxoplasmosis, or maternal drug use.

Checking infants for congenital cataracts is very important because the brain’s visual system will not develop normally if a clear image does not reach the retina. Most infants are checked by their pediatricians and referred immediately to a pediatric ophthalmologist if necessary. Some children will have congenital cataracts that are not found until their eye exam with the optometrist. Because these are usually small and visually insignificant, no treatment is necessary.

Posterior subcapsular cataracts can occur in younger patients in their 40s and 50s. These cataracts can also grow quickly, so a younger patient with rapidly decreasing vision may have a PSC that needs to be treated as soon as possible.

Most cataracts are found in elderly patients. The incidence of cataract increases
noticeably from patients in their 60s (32 percent for nuclear cataracts) to their 80s (55 percent for nuclear cataracts). Patients with risk factors are likely to develop cataracts at any age.

**What are some risk factors for cataract formation?**

- **Smoking** has been shown to be associated with cataracts.
  - Patients with diabetes are likely to get age-related cataracts sooner and have them grow faster. Additionally, these patients are at risk for a type of cataract due to high blood sugar that can develop rapidly, even in a few days.
  - Some medications can increase the risk of cataract. Of particular interest to optometrists are steroid-induced cataracts, usually PSCs. These are one of the reasons that doctors are cautious about prescribing steroids and want to monitor patients taking these drugs more closely.
  - **Trauma** can also cause cataracts, especially a penetrating injury to the eye.

Other risk factors include many systemic conditions such as Down syndrome and Fabry’s disease and ocular conditions such as glaucoma and uveitis.

**What can a person do to decrease the chance of getting cataracts?**

Of course, a person should do what they can to reduce the risk factors mentioned above. Quitting smoking, keeping blood sugar levels well-controlled and using medications judiciously will all help. **Wearing sunglasses** is recommended because exposure to ultraviolet (UV) light is associated with an increase in cataracts. **Good nutrition** and/or a multivitamin may also help as more evidence is accumulating that this will also play a role in cataract prevention.

**What happens after a patient is diagnosed with a cataract?**

Many cataracts are first diagnosed when the cataract is very small or very mild. Often the patient can still see 20/20 and is only having some problems with small print or glare. For these patients, the doctor will usually recommend monitoring the condition at an annual exam. It is difficult to predict how fast a cataract will progress, and some patients will have mild cataracts for decades before any treatment is considered.

Other patients will have visually significant or rapidly progressing cataracts. Scheduling surgery or referring the patient to a surgeon is recommended at their first visit. Visually significant usually refers to vision that is 20/40 or worse, which is when insurance will pay for the surgery. However, if glare is contributing to the problem, the surgery may be done when visual acuity under non-glare conditions is better than 20/30.

Patients should also understand that they can have cataract surgery at any time as an elective procedure they pay for themselves. “Clear lens extraction” is a refractive procedure that is essentially cataract surgery when no cataract exists.

**What can be done for a patient with cataracts who isn’t having surgery yet?**

Changes in patients’ spectacle prescription often contribute to the blur experienced by patients with cataracts. The changes in the lens can also change the shape of the lens and therefore the power of the lens. Patients will often notice that their near vision gets better while their distance vision gets worse. This myopic refractive shift can be corrected with a new spectacle prescription, and the patient should be encouraged to keep their spectacles up to date and their vision corrected as well as possible. An antireflective coat will let more light through their spectacles and help in low-light conditions. Of course, a UV coating is important to decrease the progression of the cataract.
Some Useful Terms

**Crystalline lens**: Another term for the lens inside the eye.

**Phaco/phakic**: Words with these phrases in them refer to the lens in the eye.

**Aphakia**: Refers to an eye without a lens, usually after cataract surgery.

**Pseudophakia**: Refers to an eye after cataract surgery that has an artificial lens implanted in place of the cataract.

**Intraocular lens (IOL)**: The artificial plastic replacement lens put in by the surgeon.

**A-scan**: An ultrasound measurement of the length of the eye needed before cataract surgery. If you are scheduling surgery, you may also need to schedule this procedure.

**Phacoemulsification**: A procedure during cataract surgery to break up the lens and make it easier to remove.

**Clear lens extraction**: This is when the lens is removed when no cataract is present. This refractive surgery is done to change the prescription of the eye.

**Multifocal IOL**: A multifocal IOL can be placed inside the eye to improve the range of vision after cataract surgery.

**Toric IOL**: This IOL can be used to correct astigmatism.

**Monovision**: After cataract surgery, a patient can choose to have one eye corrected for distance and one eye corrected for near.
“Cataracts for Beginners”
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Select the option that best answers the question.

1. What is a cataract?
   a. a yellowish bump on the white part of the eye or on the cornea
   b. any opacity of the cornea
   c. any opacity of the lens
   d. an opacity of the lens obscuring vision

2. The fibers that hold the lens in place are called__________.
   a. cortical ligaments
   b. zonules
   c. the capsule
   d. suspension fibers

3. The doctor checks for cataracts__________.
   a. only in patients over 60 years old
   b. only in any patient whose vision is not 20/20
   c. only with a dilated comprehensive exam
   d. at almost every exam, including office visits

4. Symptoms of cataract include__________.
   a. blurry vision
   b. redness without pain or discharge
   c. pain with eye movements
   d. a feeling of pressure inside the eye
5. A yellowish cataract in a 72-year-old patient causing central blur is likely to be a ________.
   a. nuclear cataract
   b. cortical cataract
   c. posterior subcapsular cataract
   d. capsular cataract

6. A 47-year-old man with rapidly decreasing vision is likely to have a ________.
   a. nuclear cataract
   b. cortical cataract
   c. posterior subcapsular cataract
   d. capsular cataract

7. Which patient will not have a cataract?
   a. 6-month-old infant
   b. 13-year-old with 20/20 vision
   c. 65-year-old who is pseudophakic
   d. 70-year-old with macular degeneration

8. Some risk factors for cataract are ________.
   a. smoking, alcohol and pregnancy
   b. smoking, diabetes and steroid drug use
   c. diabetes, hypertension and glaucoma
   d. age greater than 60, smoking and macular degeneration

9. What advice should you give patients to reduce their risk of cataract?
   a. Quit smoking
   b. Wear sunglasses
   c. Take a multivitamin
   d. all of the above

10. How quickly will a cataract get worse once it's been diagnosed?
    a. It is difficult to predict. It could be decades.
    b. If it is a congenital cataract, it will get worse rapidly.
    c. If it is a posterior subcapsular cataract, it is likely to be stable.
    d. The patient is likely to need surgery within five years.

11. When can you schedule a person for cataract surgery?
    a. only when their vision is 20/60 or worse
    b. only when their vision is 20/40 or worse
    c. only when their vision is 20/30 or worse with glare
    d. anytime the benefits outweigh the risks

12. If a cataract patient isn't having surgery yet, you should__________.
    a. make sure they schedule a follow-up appointment in three months
    b. make sure they schedule their next exam with a cataract surgeon
    c. make sure their spectacles are updated to improve their vision
    d. make sure they can pass their driver's exam
13. An intraocular lens (IOL) ________.
   a. is an artificial glass lens placed inside the eye by a surgeon
   b. is an artificial plastic lens placed inside the eye by a surgeon
   c. is an artificial lens placed on the eye like a contact lens
   d. cannot correct astigmatism

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“Cataracts for Beginners” 3