



National Academy of Opticianry

Continuing Education Course

Approved by the American Board of Opticianry

Understanding Pediatric Dispensing

National Academy of Opticianry

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National Academy of Opticianry

PREFACE:

This continuing education course was prepared under the auspices of the National Academy of Opticianry and is designed to be convenient, cost effective and practical for the Optician.

The skills and knowledge required to practice the profession of Opticianry will continue to change in the future as advances in technology are applied to the eye care specialty. Higher rates of obsolescence will result in an increased tempo of change as well as knowledge to meet these changes. The National Academy of Opticianry recognizes the need to provide a Continuing Education Program for all Opticians. This course has been developed as a part of the overall program to enable Opticians to develop and improve their technical knowledge and skills in their chosen profession.

The National Academy of Opticianry

INSTRUCTIONS:

Read and study the material. After you feel that you understand the material thoroughly, take the test following the instructions given at the beginning of the test. Upon completion of the test, mail the answer sheet to the National Academy of Opticianry, 8401 Corporate Drive, Suite 605, Landover, Maryland 20785 or fax it to 301-577-3880. Be sure you complete the ABO – NCLE evaluation form on the answer sheet. Please allow two weeks for scoring and test results.

CREDITS:

The American Board of Opticianry has approved this course for one (1) Continuing Education Credit toward certification renewal. To earn this credit, you must achieve a grade of 80% or higher on the test. The Academy will notify all test takers of their score and mail the credit certificate to those who pass. You must mail the appropriate section of the credit certificate to the ABO and/or your state licensing board to renew your certification/licensure. One portion is to be retained for your records.

AUTHOR:

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INTENDED AUDIENCE:

This course is intended for opticians of all levels.

COURSE DESCRIPTION:

This course will present information regarding the unique skills needed to dispense eyewear to children. The course will focus on toddlers and children as well as tweens and teens. Identifying specific needs in fit, fashion, and function for eyewear on children will be presented, including proper measurements, and anatomical considerations. This session will also present the importance of communicating with children and their parents, and dispensing eyewear. Statistics will be presented on children's visual needs. It will begin with an ocular embryology and vision disorders of children.

OBJECTIVES:

Upon completion of this course, the student should be able to:

- Have a better understanding of the early development of the eye
- List at least three infant eye abnormalities
- Discuss how vision can affect learning disabilities
- Identify the major symptoms when a child is having problems with vision
- Know how to properly fit the pediatric patient with eyewear
- Understand the unique fitting challenges of pediatrics
- Communicate with both parents and children on the eyewear needs of the child

Understanding Pediatric Dispensing

Diane F. Drake, LDO, ABOM, NCLEM, FNAO

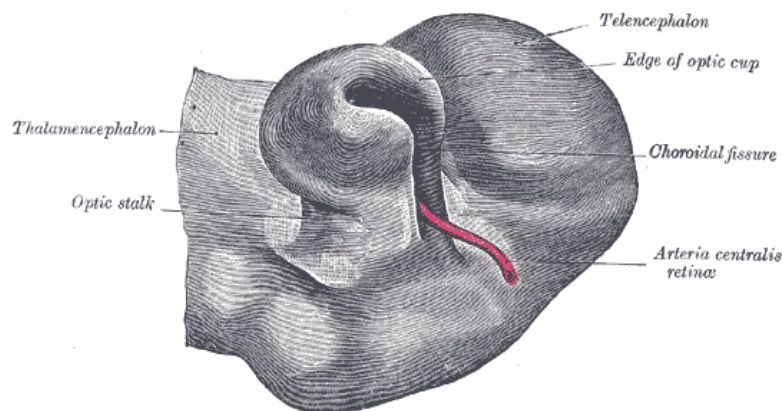
Introduction

Dispensing eyewear to children can be rewarding as well as challenging. In other words, it takes patience with these young patients. The optical dispenser has to be flexible and enjoy working with children. In addition, since the purchase will be made by the parent or guardian, one has to understand them as well.

Early Eye Anatomy

While we won't be discussing the entire development of the human eye, we will touch on some of the earlier developmental stages. The eye begins developing very early during embryology. Tissues of the body are derived from three types of tissues: the ectoderm, the endoderm, and the mesoderm. Tissues of the eye are derived from the ectoderm and the mesoderm (also called the mesenchyme). From the ectoderm is developed the neural tube, the optic nerve and the smooth muscle of the iris. The neural tube forms the brain. The eye could be identified as an outgrowth of the brain. The spinal column is the other side of the brain. So, the neural tube ultimately produces the retina. The mesoderm produces the corneal stroma, the sclera, the choroid, the iris, the ciliary musculature, part of the vitreous body, and the cells lining the anterior chamber.

The optical stalks are formed during the 2nd week of gestation and are protrusions from the forebrain. They ultimately become the optic nerve. They attach the optic vesicles to the wall of the brain. The optic vesicles form the optic cups. Initially, the optic cups develop from the optical vesicle folding in after the vesicle separates from the ectoderm. Two types of cells develop within the optic cup. The outer layer becomes the pigmented layer of the retina and includes the rods and cones. The nerve layer of the retina is derived from the inner layer. These optic cups have a notch that is continuous with a groove that becomes the choroidal fissure. The stalks become complete during the 7th week of embryology when the choroidal fissure that surrounds the hyaloid artery fuses together.



Some Infant Eye Abnormalities

Coloboma

Failure of the choroidal fissure to properly close during the first 7th week of pregnancy will cause an eye defect called a coloboma. The coloboma may involve the pupil, the ciliary body, the choroid or optic nerve. If it involves the pupil, it is oftentimes referred to as a cat eye pupil. It appears like a notch on the iris. It also affects the proper dilation/constriction of the pupil and will allow too much light into the eye.

Anophthalmia

The Greek meaning of anophthalmia literally means without eye. Remember, the prefix 'an' placed in front of another word means the opposite. Since ophthalmia means with eye, then anophthalmia would be the opposite. It can occur as a result of an interruption during fetal development. Some studies show that it may be genetic. In addition, it may be bilateral or monocular. While the eye may not be present, there may be ocular tissue. There may also be an eye socket present. If there is an eye socket, it is important that the infant be fitted with a prosthetic eye as soon as possible since the bones are still forming. This will allow the child to have a more natural appearance as he or she ages.

Microphthalmia

Micro means small, therefore microphthalmia is a small eye. It is sometimes called small eye syndrome. In the simple form, the eye is intact, but it has a short axial length. The eye is sighted, but usually has a refractive error. Since it is short, the refractive error is hyperopia. In the severe form, it may be misdiagnosed as anophthalmia. An MRI is used to identify if there is any ocular tissue. The severe form is usually not a sighted eye. In addition, oftentimes, since there is no sight, and the eye is small, a prosthesis may be used to give a more natural appearance.

Macrophthalmia

Macro means large; therefore, it is a large eye. It is sometimes called large eye syndrome. The axial length of the eye is abnormally long, causing myopia.

Strabismus

At birth, most infants are not able to control the movements of their eyes, and the eye may drift or look crossed. A true muscle imbalance will cause strabismus. Strabismus is a disorder in which the two eyes are not correctly aligned. If untreated it can lead to amblyopia - also called "lazy eye"- a condition in which the vision in one eye deteriorates. Strabismus and amblyopia are together the most common causes of visual impairment in children.

Cataract

A cataract in an infant can be genetic. It can also be caused by trauma or systemic diseases during early pregnancy such as rubella. Surgery is needed early if the cataract is dense, as vision will be severely impaired and will inhibit visual development.

Other Factors

There are other factors that can cause eye defects. For example, teratogenic factors (drug abuse, infection, and certain medications) occurring in the 1st trimester of pregnancy often result in eye defects.

Vision Landmarks in Children

Infants

The eye is not completely developed at birth. A child's vision develops as they grow. An infant's eyes should be checked at birth and during well-baby visits throughout the first year by their pediatrician. All babies should receive an infant eye exam. Babies usually see movement before anything else. Full-term babies should be able to see their mother's facial expression within a week of birth. Color vision and depth perception aren't yet fully developed and eye muscle coordination is also very immature. Babies often have eyes that are turned in, turned out or not working as a team, a condition known as strabismus. If this problem doesn't resolve itself by the age of three or four months, the infant should be examined by a pediatric ophthalmologist.

The following is a list at which age an infant's eyes should have achieved certain functions:

- Contrast sensitivity (ability to detect subtle brightness differences): 2-3 months
- Convergence (move eyes together as team for near viewing): 2 months
- Accommodation: (ability to focus eyes for near viewing): 2-3 months
- Smooth pursuit (following eye movements): 2-3 months
- Saccades (refixation eye movements) step-like at birth: 3 months
- Color Vision: 3-4 months
 - Infants see black/white/gray the best at birth which also helps with contrast
- Stereopsis (fine depth perception): 6 months
- Visual acuity (ability to discern fine details): 8 months
- Refractive error (focusing error of eyes; i.e. the need for spectacles): 12 months

Toddlers, Preschoolers, and Grade schoolers

A child's vision will continue to develop as they become toddlers and preschoolers. If they aren't developing good hand/eye coordination, it may be visually related. They should be able to reach for something and not overshoot/undershoot it. Their depth perception should be developed. If no earlier symptoms are noticeable, a child should have a thorough eye exam by three years of age to determine if there are any hidden vision concerns. If there are any of the warning signs that there are vision difficulties, this exam must be done much earlier. Their eyes should be examined again before they start school.

Some Statistics

The statistics in this course have been obtained from The Vision Council.

Twenty-five percent of the population of the USA are under 14 years of age. Ten percent of all preschoolers have vision deficiencies and 25% of children Kindergarten – 6th grade have vision deficiencies. Eighty percent of learning is accomplished through vision during the first twelve years of a child's life. Ninety-five percent of vision problems are missed during a routine school vision screening. One in four children has a vision problem that results in a learning disability. That means that early detection of vision problems is crucial.

Get 'Em While they're Young

With 25% of the population in the USA being 14 and under and 25% of children requiring some form of vision correction, there is a huge market for dispensing to children. This section is designed to help increase your pediatric knowledge. In addition to dispensing information, this section will include information on getting the pediatric patient's attention in order to properly fit their eyewear. Communicating with the kids and their parents will be discussed. Identifying specific needs in fit, fashion, and function for eyewear on children will be presented as well as techniques for proper measurements.

Symptoms That Indicate a Child May be Having Problems with Their Vision

Identifying the symptoms that may indicate a problem with a child's vision can require acute observation. Because vision is learned, if a child has vision problems early on, they likely don't know how to tell a parent or teacher that they're having difficulties. That's why it's important to be able to identify the symptoms of vision problems in children. Vision problems can include any of the following:

- They may have excessive blinking
- They may dislike and/or avoid close work
- They may have a short attention span or are frequently daydreaming
- They may place their head close to a book when reading or lose their place while reading
- They may complain of headaches, nausea, and dizziness
- They may be excessively clumsy
 - Bruises may be more noticeable on one side than the other
 - Others may notice they bump into things more on one side
- Squinting, closing or covering one eye
- Constantly holding materials close to the face
- Turning or tilting the head to one side
- Rubbing eyes repeatedly
- One or both eyes turn in or out
- Redness or tearing in eyes

Some Red Flags Include the Following:

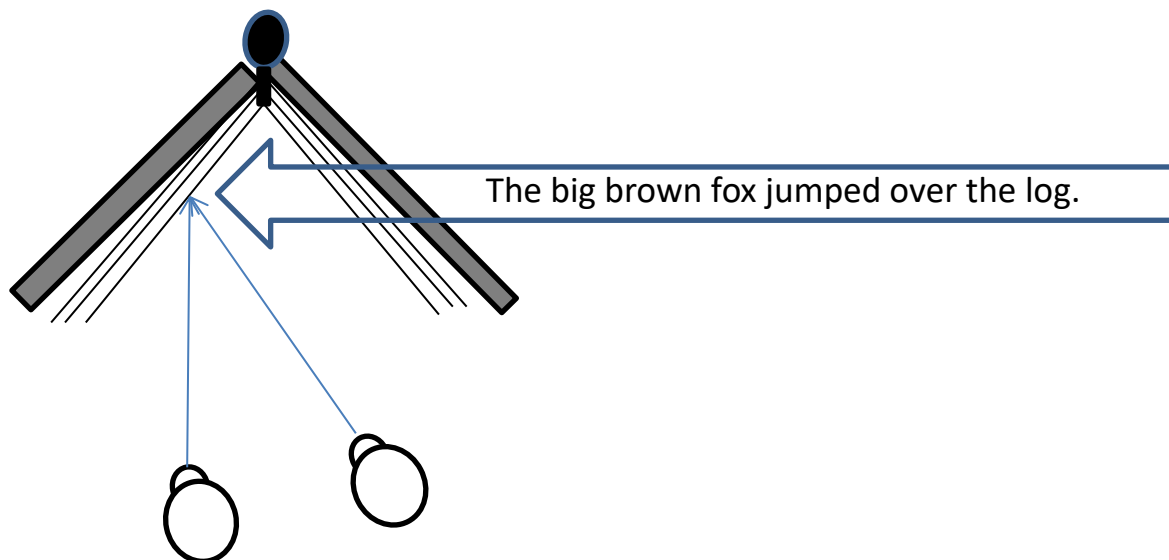
- Premature birth
- Developmental delays
- Family history of "lazy eye" or thick glasses
- A disease that affects the whole body, such as diabetes, sickle cell or HIV

Vision Disorders and Learning Disabilities

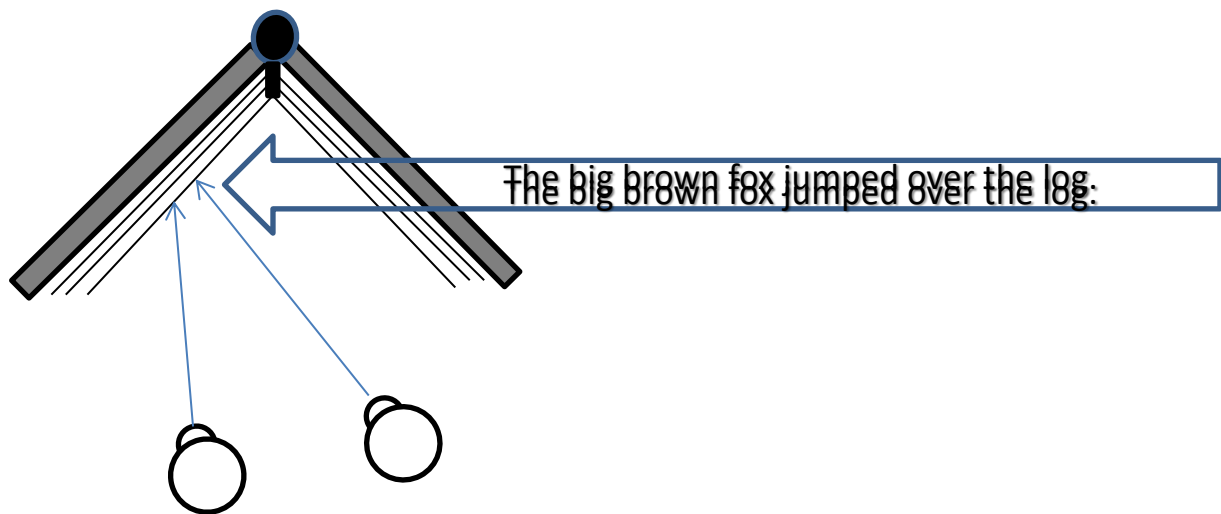
There could be an entire course devoted to nothing else than vision disorders and learning disabilities. An example of concern in this area is illustrated by a true story: a young mother brought her first-grade son in for an eye examination. She had been told for years that the child had learning disabilities and that constituted poor behavior. She had taken him to his pediatrician after taking him to the local health department. An optician had been at his school, presenting information to some of the teachers about the importance of a true eye examination for all children rather than just a vision screening. Some of the symptoms that were discussed showed that there could be vision problems in children, and one teacher specifically took it to heart. She looked at this little boy, who everyone else thought had a learning disability and spoke to the mother about at least just trying an eye examination. The result was that the child had a fairly significant refractive error; his prescription was +3.50 OU. He had been smart enough to hear the child in front of him recite the vision chart during the school screening and therefore passed the test. Two months after getting his glasses, his mother brought him in to see the optician and told them that he had gone from the bottom of his class to almost the top of his class. He was so eager to learn since he could now see. His behavior improved as well. The moral to the story: Never discount the fact that vision can have such an impact!

There is a connection between eye teaming problems and attention deficit disorders. Children with convergent insufficiencies and convergence excess are often misdiagnosed with ADHD or ADD, due to the fact that they cannot maintain control of eye movements for extended periods of time at close-up distances. To these children, images and print may appear to jump or move. So, they stop wanting to concentrate, and that's where misdiagnosis may occur.

The first image below shows how the eyes work together to fuse an image, or in this case a line of print. The illustration shows that there are clear letters in order for the child to read. A child who can see well to read can develop a love for reading early on and it will benefit them for the rest of their life.



The next image below shows how the eyes would see an image if the muscles of the eye don't work together to fuse the image, or in this case a line of print. This illustration shows that letters are not clear, and the child would soon tire of trying to interpret the image.



As opticians, we may not identify the actual problem, but our responsibility is to identify the possibility and do what we can to ensure that the child has their eyes checked by an eye doctor.

Kids and the Great Outdoors

Children really need sunwear protection, in some respects, even more than adults do. Look at some of the facts:

- Children are more vulnerable to eye damage from long term exposure to the sun and UV
- They spend more time outdoors than average adults
- A child's crystalline lenses transmits more UV to the retina than adults
 - Crystalline lenses begin as clear with no UV protection
- Eighty percent of a person's lifetime exposure to UV occurs by age 20
- Children need impact resistant lenses to protect their eyes
- Good quality sunwear needs to fit properly
- Kids love brands; they are loyal

In addition, children with fair complexions and light eyes have less melanin to protect the surface of their eyes and around their eyes. This means that we need to discuss the dangers of UV with parents and discuss the need for the children to wear good quality sunwear when outdoors.

Child Friendly Practice

Now it's time to think about how to make your office child friendly. This is actually marketing to the pediatric patient. If you want anyone to be comfortable in your office, you have to think of ways to make them comfortable. That means for the pediatric/child patient, what best appeals to kids.

Ensure that your office uses child friendly spaces. Ideally this space would be in a separate area from adult displays. Keep items like frames at a child's level. Use kid-tested color in décor: bright colors that may not appeal to adults. Utilize kid focused vendors. For example, most of the more successful frame companies have done research in kid décor and colors. That means that you can take advantage of their research and utilize your vendor point of purchase (POP) materials artistically. Kids are brand smart as well, and they are comfortable with their favorite brands, so use brands that appeal specifically to kids.

Understanding the importance of kid focused in-office merchandising means that you also know that you have to keep the tweens and teen areas separate from kid's frames. Older children don't want to look like little kids. It's most effective to appeal to every age group. Keep your displays current. You also have to be sure that if you have a picture in your display of a specific frame, to have the frame in stock. If you have kids, think about what they like, and if you don't have kids, observe kids to find out what they like. Even ask kids about what they like and don't like.

How to Build a Pediatric Practice

You may want to specialize in a pediatric practice, or you may want to build up your pediatric practice. If you do, then consider the previously mentioned marketing tips. You need to reach out to kids and their parents. Utilize newsletters to discuss kids' visual health issues and introduce new product lines. Have coloring contests. Visit local schools to give presentations on kids' vision and the impact of vision on learning. Become an expert on kids' vision. Offer optical accessories that appeal to kids like lanyards, cleaning kits designed for kids, and specialty cases.

Communicating with Both Parents and Children on the Eyewear Needs of the Child

Include the parents in discussing the needs of their child. Maintain eye contact with the parents and the child. In addition, identify what the parents want. What they usually want is value, durability, choices, protection, and confidence in name brands. Kids want style, color, cool looks, comfort, and they want name brands as well.

Be friendly, empathetic, and reassuring. This is often a first-time purchase of glasses for a child. Introduce yourself. Tell them how you prefer to be addressed. Use the child's name and use it frequently during your dispensing process. Ask non-threatening questions to make the child feel comfortable. Get on their level; use positive body language and be approachable. Think on your feet, because a child will ask questions and say things that adults would never say or ask. Be flexible and know when to make changes in your order of dispensing. You may like to do things in a very specific order, but sometimes you have to switch it up for a child to help maintain their attention and trust.

Because younger patients may fear or at least be wary of doctor's offices, it's recommended that you not wear white lab coats, because it may frighten children. Demonstrate product durability and discuss warranties with parents. If, however, you are demonstrating the flexibility of a frame or the scratch resistance of a lens, it would be wise not to allow the child to see the demonstration, as they may try it repeatedly and break the frame or mar the lenses, as they usually like to enthusiastically mimic what's being demonstrated.

Properly Fitting the Pediatric Patient with Eyewear

Start with the prescription. Read it and analyze it. Understand the visual condition. Discuss the child's vision with the parent. What are the glasses to be used for? Ensure that the prescription matches what the parent discusses. Visualize the finished Rx. Consider edge/center thickness, nose pad adjustments, and other eyewear appearances and measurements. Will the lenses be extremely thick? Will magnification be an issue? Use your knowledge of the characteristics of lenses to help identify what to recommend ensuring that the child will not only see well, but that they will look good, as well.

Take accurate measurements. That means that you need to take monocular PDs. You may be able to use a pupilometer, but if the child is very young/small, you may need to use a PD ruler to measure the child. Use demo lenses to mark seg heights. To hold their attention in order to take accurate measurements, you may need to use role playing or games. Sometimes it's also easy to use a toy to get and hold a child's attention, such as hand puppets to talk to the child.

Pediatric Fitting Process

Discussing lens options first helps to establish your expertise. Use product demos. Ask lifestyle questions and be an active listener. Watch for body language that means either the parent or child doesn't understand something or has questions.

Frame selection comes next. Discuss the features, advantages, and benefits of frames. For example:

- Spring hinges help maintain adjustments and are more able to take abuse
- Well-fit bridges balance the weight of glasses
- Temples help secure frames to the head and stop eyewear slippage
- Colorization techniques in metal frames means may make them hypoallergenic or less allergenic and less corrosive

The frame fit is crucial for children. Children are not just small adults. They need to be perfectly fitted. Bridge fit is critical. Little bridges are easily molded and if the bridge doesn't fit well, you could be responsible for a malformed bridge on the child. Check for fitting problems and possible modifications that may be needed. Frame shape should contrast to face shape. By doing so, the frame shape compliments the face shape. The eyes should be centered to get the full benefit of the prescription.

Some things to be conscious of when fitting children include the following:

- Smaller head as well as width
- Generally, have a reduced crest height
- Have a smaller/flatter bridge
- Have a wider splay angle due to flattened bridge
- Cannot use as much pantoscopic tilt

Consider different temple styles for the child. While cable temples may seem to be the answer for slipping, they still have to be the correct size and fit. Children also have sensitivities to many materials, so consider them when discussing frame materials. Hypo allergenic materials are a huge consideration.

Discuss with the parents that adjustment is important and to bring their child in for eyewear tune-ups regularly.

Since children are very active, safety is important. Lens materials like polycarbonate or Trivex offer the highest impact resistance. As a matter of fact, these materials are considered 10 times more impact resistant than other materials on the market. Another newer material that is not quite as impact resistant is Tribrid. It is thinner than Trivex but is only 6 times more impact resistant than other materials. Newer materials are being developed as this is written, so be sure that you stay abreast of all lens technology. You need to ensure that you present the benefit of scratch resistance to the parents. In addition, polycarbonate, trivex and tribrid have UV inhibiting properties up to 380 nanometers in the lenses inherently, so discuss that protection with the parents. This helps ease their minds about harmful UV radiation and its potential to damage young eyes.

It's a good idea when you mention notification of when the glasses will be ready that you also discuss scheduling an appointment with you, since you created rapport with the child. That will put the child and parents more at ease during the actual delivery of the glasses.

When delivering the glasses, make sure that they have been verified first. They should be clean and bench aligned. When the child comes in, ensure that the frames are a perfect fit. Remember, do not malform a child's bridge or face with a poor-fitting frame. Tell the child how to care for the glasses and give them a protective case. If a brand case comes with the frame, discuss the brand as well. Tell the child that glasses are used to help them see their best. Discourage them from letting their friends try on their glasses. Tell them to keep their glasses in their case when not being worn. Check the child's vision through their new glasses and ask what they can see. Explain when they are supposed to wear their glasses and when they aren't. Explain any warranty on the glasses to the parents.

Sports Protective Eyewear for Children

According to The Vision Council, each year 38,000 sports-related eye injuries are reported in the United States and that 90% of them could be prevented. A survey by The Vision Council reports that nearly 9 in 10 people (89%) believe children should regularly wear protective eyewear when playing sports, yet just slightly over 1 in 3 (36%) report that their children actually do so. For the reasons just mentioned, sports goggles should be standard equipment. The type of sports goggles should be specific for the nature of the sport for the nature of the sport and should have been tested for that specific sport by the ASTM.

Protective goggles (sports eyewear) must be made of the proper materials (both frame and lenses) and properly fitted.

Here are some of the things you should look for:

- Padded or rubber bridges to keep the goggles comfortable
- Deeply-grooved eye wires to keep the lenses from falling out if the frame sustains impact
- A face-formed shape to provide a wider field of view
- Headband attachments to keep the frames from slipping
- Lenses made from impact resistant lens material such as polycarbonate or Trivex
- One-hundred percent UV protection and a scratch resistant coating

Conclusion

As you can see, there's a lot to know about pediatric dispensing. You need to understand the child's eye. In addition, you need to be able to communicate well with both parents and child. You also need to select eyewear for *function, fit, and fashion*.

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