

TEACHER'S GUIDE TO UNDERSTANDING VISION PROBLEMS IN YOUNG CHILDREN

Terminology:

Visual Acuity refers to the clarity of vision or how well a child sees, measured at a distance of 20 feet (6 metres). Normal visual acuity is commonly termed “**20/20 vision**”. (In Canada, the metric equivalent of 20/20 is 6/6.) A child with 20/20 vision can see clearly at 20 feet what an adult with normal vision can see at that distance. A child with 20/100 vision must be as close as 20 feet to see what an adult with normal vision can see at 100 feet. Visual acuity develops steadily throughout early childhood, and reaches adult-level by age 6-7 years. At age 4-5 years, visual acuity of 20/20 – 20/40 (6/6 – 6/12) is expected.

Refractive Error occurs when, due to the size and/or shape of the eyeball, images formed on the retina are not in sharp focus, resulting in blurred vision.

1. **Hyperopia** (Farsightedness): Hyperopia is a condition in which the eyes must exert extra focusing effort to see objects clearly, especially at close distances. Hyperopia results when the length of the eyeball is shorter than average. Most children have mild hyperopia, and, with a strong focusing ability, have no difficulty seeing clearly at all distances. However, children with severe farsightedness may experience fatigue, blurred vision, headaches, lack of concentration and/or crossed eyes.
2. **Myopia** (Nearsightedness) is a condition in which near objects are seen clearly however distant objects appear blurred. Myopia results when the eyeball is longer than average. Children who are born prematurely or have family members with severe myopia are more likely to develop myopia at a young age. Children with significant myopia often hold materials very close or move up close to objects to see them.
3. **Astigmatism** is a condition in which objects appear distorted or blurred, both at distance and at near. Astigmatism usually occurs when the cornea (front surface of the eye) is not evenly curved and is more “oval” than “round”. It often occurs in combination with farsightedness or nearsightedness. Children with significant astigmatism often turn their head to the side when looking at objects, and may experience headaches or eyestrain with concentrated visual tasks.

Low degrees of refractive error may not require correction at a young age, since there are limited visual demands in preschool and kindergarten. The need for spectacle correction may be deferred until a child is older.

High degrees of refractive error, however, may cause visual discomfort and may lead to the development of strabismus and amblyopia, if left untreated. In such cases, spectacles are needed for full time wear or for use with specific visual activities. In some situations, contact lenses also may be prescribed.

Strabismus is a condition in which the two eyes do not align properly. One or both eyes may turn in (esotropia), out (exotropia), up (hypertropia) or down (hypotropia). The eye turn may be present constantly or periodically. In some cases, the eye turn may be noticeable on direct observation; in other cases, professional assessment may be needed to detect the eye turn.

Strabismus causes a loss of binocular co-ordination, resulting in either double vision or suppression of the turned eye. (In suppression, the brain "turns off" the turned eye and elects to see only with the stronger eye.) There may be associated difficulties with depth perception, eye-hand co-ordination and fine and/or gross motor skills. Common observations include:

- A tendency to cover one eye or turn the head when looking at things
- A tendency to trip over or bump into objects
- Difficulty holding a pencil or colouring within the lines
- Difficulty with construction toys such as Lego or building blocks
- Reduced attention for concentrated visual tasks

Strabismus may be treated with spectacles, visual exercises or eye surgery.

Amblyopia is the incomplete development of vision in one or both eyes, as a result of uncorrected refractive error or strabismus in early childhood. It is characterized by reduced vision at all distances, even with prescription spectacles. Untreated amblyopia may lead to functional blindness in the affected eye.

In many cases, there are no signs or symptoms of amblyopia, since the stronger eye can compensate for the weaker eye in many situations. In other cases, the signs and symptoms of amblyopia may be similar to those associated with strabismus.

Amblyopia is treated by stimulating the vision in the affected eye, often by using an eye patch or eye drop to temporarily block vision in the stronger eye. Such therapy is done in conjunction with treatment for the underlying cause of amblyopia (spectacles, contact lenses and/or eye surgery). Early treatment is important, as therapies are less effective after the age of 9 years.

Vergence Disorder refers to a dysfunction of the eyes' ability to turn either inward (convergence) or outward (divergence) when focusing on and tracking objects. Convergence insufficiency is the most common vergence

disorder and is characterized by a weakness in the ability for the eyes to maintain focus and fixation during nearpoint visual activities.

Accommodation Disorder refers to a dysfunction of the eye's ability to automatically change focus from seeing at a distance to seeing at near.

Symptoms of vergence and accommodation disorders include blurred vision, double vision, eyestrain, headache, fatigue and difficulty concentrating (particularly while reading).

Vergence and accommodative disorders may be treated with spectacles and/or visual exercises.

Colour Vision Deficiency is a congenital condition in which there is difficulty distinguishing certain colours, such as red and green, red and brown, blue and purple, or orange and yellow. The condition affects 8% of males and less than 1% of females; it is present at birth and remains unchanged throughout life.

Colour vision deficiency may interfere with learning in the classroom, since many learning materials rely heavily on colour perception.

There is no treatment to cure colour vision deficiency.

Eye Health Abnormality, while uncommon in children, may result from injury or hereditary / congenital conditions. Treatment is aimed at improving the eye condition and maximizing vision and visual development.

TEACHER'S GUIDE TO HELPING YOUNG CHILDREN WITH VISION PROBLEMS

General Strategies:

1. Look for the signs of vision problems in children and alert parents / caregivers as necessary. Encourage professional comprehensive eye examinations, especially for those children who are suspected of having a vision problem.
2. Encourage proper visual hygiene habits: proper viewing distance (1-3 metres for distance, 30 cm for near); good posture (head, neck and back straight); good lighting; regular breaks (every 20-30 minutes) from concentrated viewing of television, computer games and other tasks.
3. Encourage proper pencil grasp and positioning of paper when printing; discourage turning page sideways.

Strategies for Children Who Wear Spectacles:

1. Encourage spectacle wear according to the recommended schedule.
2. Provide appropriate reminders to children who forget to wear their spectacles.
3. Encourage children to look through spectacles lenses, rather than over the top.

Strategies for Children with Strabismus, Vergence Disorders, Accommodation Disorders:

1. Provide specific seating in the classroom, to maximize the use of vision. This may involve seating the child on a particular side of the room, closer to the blackboard, etc.
2. Provide assistance and guidance with fine motor tasks (copying, printing, etc.). This may include using paper with bold lines on which to print, using larger spaces between lines of print, reducing the amount of detail per page, presenting materials centrally or to the preferred side, keeping the work space organized and uncluttered and allowing more time to complete work, if required.
3. Alternate between visual and verbal tasks, so that periods of visual concentration do not exceed 20 minutes.
4. Provide extra supervision with sports activities.

Strategies for Children with Amblyopia:

1. Support use of an eye patch in classroom, if previously agreed upon with parents. This may include providing opportunity for the child to use the eye patch appropriately during classroom activities, providing proper supervision when the patch is worn, helping other children to understand the need for patch, providing an opportunity for other children to experience eye patching, discouraging other children from making negative comments about eye patching.

Strategies for Children with Colour Vision Deficiency:

1. Eliminate colour coding from all activities. When colour coding is necessary, review the procedure with the child and modify the colours to be used, according to the child's individually colour discrimination ability.
2. Provide assistance with learning to name and identify colours, as necessary.
3. Be aware that colour vision deficiency may pose a future restriction from certain occupations (police officer, firefighter, pilot, electrician, etc.).

Strategies for Children with Eye Health Abnormalities:

1. Seek information regarding how the eye health abnormality affects the child's vision.
2. Consult with a vision itinerant teacher, if necessary, to implement additional strategies to maximize the use of vision for classroom activities.