Common Eye Conditions and Classroom Accommodations for Children with Down Syndrome

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As educators and parents of children with exceptional learning needs, one of our goals is to remove as many obstacles as possible to create successful, meaningful, and enriching learning experiences. Some of these can be seemingly unobtrusive and unnoticed, yet the resolution of those obstacles can open the door to a much wider world. Vision problems are one such consideration: many students with multiple challenges don’t qualify for vision impairment program services, but have vision deficits that need medical and educational attention.

Children with Down syndrome are at a significantly higher risk for eye disease: the American Academy of Pediatrics reports a finding of 60% (2001). The Down’s Syndrome Association Medical Series (United Kingdom, 2007) reports the following prevalence information in children with Down syndrome:

- approximately 20% have strabismus,
- approximately 20% have hyperopia (farsighted),
- approximately 14% are have myopia (nearsighted), and
- approximately 30% have astigmatism.

Other common eye conditions include nystagmus, cataracts, blepharitis, keratoconus, and tearing. Pair any of these eye conditions with Down syndrome and the layers of challenges accumulate.

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<th>Glossary of Vision Terms</th>
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<td><strong>Astigmatism:</strong> a defect of the curvature of the cornea producing a blurred image and distorted vision</td>
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<td><strong>Blepharitis:</strong> inflammation of the eyelids and eyelashes</td>
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<td><strong>Cataract:</strong> opacity or cloudiness of the crystalline lens — vision becomes limited if any part of the pupil is obstructed</td>
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<td><strong>Hyperopia:</strong> refractive condition where distance vision is better than near vision</td>
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<td><strong>Keratoconus:</strong> a cone-shaped cornea that results in the thinning of the cornea with decreased visual acuity and significant astigmatism</td>
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<td><strong>Myopia:</strong> refractive condition where near vision is better than distance vision</td>
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<td><strong>Nystagmus:</strong> an involuntary, rapid movement of the eyes — it can occur by itself (congenital nystagmus) or with another eye condition (sensory nystagmus)</td>
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<td><strong>Strabismus:</strong> misalignment of the eyes; eyes can turn in, out, up, or down</td>
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<td><strong>Tearing:</strong> watery eyes</td>
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**Early visual development**
In general, my observation has been that early visual skills development is delayed for infants with Down syndrome. Certain skills that would typically be integrated around six months of age may not be solid until around twelve months of age — the skills evolve at a slower pace. Research has found that referential looking is typically delayed in young children with Down
syndrome (Richard, 1986). Referential looking works as a communication tool when the child looks from the desired object, to the parent/adult, and back to the object to request help obtaining that object. The effort to acquire this skill increases significantly if the world available to that child cannot be clearly seen.

*Early evaluation, intervention, & treatment*

The sooner, the better, should be the approach in monitoring the eye health of any child and is critical for children with Down syndrome. If the eyes are not working together, binocular vision is affected and permanent vision loss can result from lack of use of the repressed eye.

The policy statement on Health Supervision for Children with Down syndrome from the American Academy of Pediatrics (2001) includes:

- **Newborns:** check for strabismus, cataracts and nystagmus
- **One month to one year:** check for above conditions and check vision at each appointment; a referral to a pediatric ophthalmologist or an ophthalmologist with experience with infants with disabilities
- **One to five years:** check vision annually, with referral to a specialized ophthalmologist, every two years, as there is a 50% risk of refractive errors between three and five
- **Five to thirteen years:** ophthalmology exam yearly
- **Thirteen years and older:** ophthalmology exam yearly

Untreated refractive errors, astigmatism, and strabismus compromise effective learning, but typically these diagnoses and the levels of visual functioning don’t meet the criteria for vision impairment special education services. Children with nystagmus and cataracts often have need for educational services from a teacher of the visually impaired. Parents and teachers of children with Down syndrome should contact their local infant learning program or teacher of the visually impaired for further information and/or a consultation.

*Reduced Accommodation*

When referring to vision, the word “accommodation” means the ability of the lens to adjust its shape to focus at various distances. The world of the infant begins at near distance — eye contact during feedings and reaching out for a parent’s face expands into watching people move across a room and moving toward objects out of arm’s reach. As children progress through elementary school, their work moves back to near distance tasks — reading, writing, and increasingly detailed math computations, which all require visual accommodation.

The School of Optometry & Vision Services at Cardiff University in Wales, United Kingdom, has done research on how accommodation impacts children with Down syndrome. Their article *Vision in children with Down’s syndrome* (obtained from [www.dsmig.org.uk](http://www.dsmig.org.uk)) states:

“Usually, children focus very easily and very accurately on near targets and it is only as we approach middle age that we expect to experience difficulty in focusing at near. We find, however, that most (over 70%) children with Down’s syndrome focus very poorly at near — they tend to under-accommodate by quite a large amount. This is consistent for any individual child, and persists even when the children wear their glasses to correct
long sight [farsightedness]. This means that near work, especially in school, must be more difficult for the children, because it is out of focus.”

While they have not been able to identify why this happens, they have tried bifocal glasses to help with under-accommodation with significant success.

At this time, the majority of the research and treatment of under-accommodation appears to be happening in the UK; however, just knowing that under-accommodation is highly probable for most students with Down syndrome allows educators a greater understanding of visual challenges and the opportunity to accommodate in the classroom.

Classroom accommodations
There are a number of easy and low-cost adaptations that can be made in the classroom that can enhance students’ learning experiences.

Positioning: if a child is having difficulty seeing items at near range, they may bend forward over their work in order to see it. This can cause back and neck strain and lead to fatigue. Supported positioning includes a table and chair at the appropriate height, a box or small stool for the feet, and a slanted reading board to hold materials upright. If appropriate for the classroom, children can also be encouraged to lie on their tummies on the floor for independent book time.

Glare: many books and magazines have a waxy coating on them that creates glare. When making experience books, use non-glare laminate paper and provide a non-glare colored overlay in case glare is a problem. When possible, lighting sources should come from behind or the side of the student. Computer screens often have a reflection and it may help to dim the lights and/or close the shades while using a computer.

Contrast: as often as possible, the background of an activity should provide high contrast. Red, green, black, and dark blue will show up well against a white board — yellow, orange, or pastel colors should be avoided. Chalkboards should be free of residue and pastel chalk colors avoided. If needed, use a thicker marker to outline or darken outlines for coloring and cutting.

Print Size/Clarity: print in books for infants, toddlers, preschoolers, and early elementary is typically fairly large and well spaced, and often very few adaptations are needed. Children with more significant vision issues may benefit from large print. As infants and toddlers become interested in exploring books, look for simple illustrations and high contrast. Activity worksheets should be as clear as possible — if there is a sheet that has been copied many times and has “fuzzies” or extraneous marks, those should be whited out to reduce the visual clutter.

Writing: as students are learning to write, worksheets often include middle lines and letters that are dotted/segmented. If a student is having difficulty with writing, try bold-line paper that doesn’t have the dotted mid-line and darken in the segmented letters. Thicker pencils or felt-tip pens for writing activities may also be beneficial, as they are darker on the paper and provide more visual feedback than a smaller, lighter pencil.
**Glasses:** if a child has prescription glasses, it is worth the time and effort to help him/her become comfortable wearing them. If the prescription is strong, be aware that the glasses make the world look totally different and it may take time for the child to realize that different is better. Glasses may be prescribed to help the eyes work together — if the eyes aren’t used to being a team, this can be hard work, so observe for fatigue and allow breaks as needed.

**Frequent breaks:** students who have difficulty because of under-accommodation, untreated eye conditions, or don’t have/won’t wear their glasses, can expend a lot of energy trying to bring their near work into visual focus. This can lead to fatigue, headaches, and an overall unwillingness to complete their work. Build in and/or let students ask for breaks — sing a song, listen to a short story on tape, take a short walk, have a small snack — anything that does not require intense visual concentration will help the student return to the task with renewed energy.

The numbers cannot be disregarded: a 60% risk factor for children with Down syndrome also having a treatable vision problem makes appropriate and timely eye care essential for the child’s health and well-being. Vision issues must be considered and addressed at each junction of a child’s education plan. Please contact your local resources for questions or concerns. Resources include teachers of the visually impaired, pediatric ophthalmologists, public health nurses, and community service organizations such as the Lion’s Club.


