

## OPHTHALMOLOGY

### The impact of vision on dyslexia

Although significant refractive errors and undiagnosed eye conditions can make reading more difficult, they do not cause learning disorders like dyslexia.



**Dr Leo Seo Wei**  
Ophthalmologist

**Dr Leo Adult & Paediatric Eye Specialist Pte Ltd**  
3 Mount Elizabeth  
#10-04 Mount Elizabeth Medical Centre  
Singapore 228510  
Tel: 6737 8366  
[www.drleoeyespecialist.com](http://www.drleoeyespecialist.com)

**F**ive to 10% of preschoolers and 20 to 25% of school-age children have vision problems. Visual acuity is necessary to discern small print when reading, and there are cases where undiagnosed eye problems may interfere with learning.

Learning disabilities include disorders in understanding or using the spoken, or written language or symbols.

Decoding and interpretation of retinal images occur in the brain after visual signals are transmitted from the eyes. Although vision is necessary for reading, it is the brain that must perform the complex function of interpreting the incoming visual images.

Reading requires the use of saccades – rapid, simultaneous movements of the eyes that swiftly change the point of fixation. Readers with dyslexia have saccadic eye movements and fixations similar to those of the beginning reader. They lose their place when reading because they struggle to decode a letter or word combination and/or lack attention.

#### Identifying eye problems

##### **Myopia**

Children with myopia (short-sightedness) experience reduced distance visual acuity.

##### **High hyperopia**

Children with high hyperopia (far-sightedness) may be uninterested in books or tasks that require near vision.

##### **Amblyopia**

Amblyopia (lazy eye) reduces visual acuity and makes it difficult to distinguish letters that are in close proximity to one another.



#### **Accommodative insufficiency (AI)**

Difficulties in accommodation do not affect decoding but can interfere with the child's ability to concentrate on print for a prolonged period.

#### **Convergence insufficiency (CI)**

CI occurs when the eyes drift outward when reading or doing work close up, resulting in double vision.

#### **What to look out for**

- Holding a book very close
- Need to turn the head to use only one eye
- Covering or closing one eye while reading
- Squinting for near or far visual tasks
- Complains of seeing double or blurred vision
- Excessive blinking or watering of eyes
- Headaches during or after reading
- Excessive rubbing of eyes while engaged in visual tasks
- Easily fatigued
- Poor hand-eye coordination
- Discomfort/redness in the eye

#### **Paediatric eye examinations**

Routine eye screenings may not disclose vision problems such

as CI, AI and high hyperopia. A comprehensive paediatric eye examination can be done for children of any age. Early detection of vision problems is crucial because some conditions, left untreated, can cause permanent vision loss. Disorders such as amblyopia can only be treated during childhood. Children born prematurely and with a family history of eye problems should be examined early, while those without risk factors should receive a detailed eye examination by the age of three or four.

Children suspected of learning disabilities and vision problems should visit an ophthalmologist experienced in the assessment and treatment of children, as some of them may have treatable ocular conditions that contribute to their learning dysfunction. A detailed assessment includes external ocular examination, dilated retinal evaluation and cycloplegic refraction. The ophthalmologist should identify and treat any significant visual defect. The ophthalmologist should not diagnose learning disabilities but instead reinforce the need for psychological, educational or other appropriate evaluation and services. 