Understanding Visual Functioning

Students with vision impairment & additional disabilities

Bronwyn Heim
# Major Causes of Vision Impairment

*PLVC, Education Qld. 1974-2011*

<table>
<thead>
<tr>
<th>Condition</th>
<th>74-81</th>
<th>90-99</th>
<th>00-03</th>
<th>03-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cataracts</td>
<td>15.8</td>
<td>2.2</td>
<td>.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Con Motor Nystagmus</td>
<td>16.5</td>
<td>8.5</td>
<td>8.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Optic Atrophy</td>
<td>11.3</td>
<td>7.6</td>
<td>8.3</td>
<td>8</td>
</tr>
<tr>
<td>Albinism</td>
<td>7.8</td>
<td>8.1</td>
<td>5.6</td>
<td>6</td>
</tr>
<tr>
<td>ROP</td>
<td>2.6</td>
<td>6.1</td>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>CVI</td>
<td>2.4</td>
<td>26.7</td>
<td>26.2</td>
<td>28.4</td>
</tr>
<tr>
<td>Optic Nerve Hypoplasia</td>
<td>1.9</td>
<td>2.9</td>
<td>5.4</td>
<td>5.3</td>
</tr>
</tbody>
</table>
Cerebral Vision Impairment

30% of the total student population receiving VI support from Ed Qld. have a diagnosis of CVI as the major cause of low vision.
CVI
2013 PLVC Research Findings

Medical

67% Epilepsy

48% Cerebral Palsy

ophthalmological

• Strabismus 58%
• Optic Atrophy 30%
• Nystagmus 18%
• Reduced Visual Fields 17%
Note

CVI should:

- Be suspected when there is a greater delay in visual development than in other areas of development.

- Not be assumed in all children with multiple impairments. Many will respond visually on a level that matches their cognitive / perceptual development.
Meaningful Measurements of Vision

- Distance Visual Acuity  $6/\textit{N}$
- Near Visual Acuity  $N \ ? @ \ ? \text{ Cms}$
- Visual Fields  $\ ? \text{ Full or } \ ? \text{ Reduced}$
Approximations of Vision with Different Acuities – Eye Chart at 6 metres

6 Metre Eyechart Normal

6 Metre Eyechart 6/12

6 Metre Eyechart 6/18

6 Metre Eyechart 6/24

6 Metre Eyechart 6/36

6 Metre Eyechart 6/60

VISUAL ACUITY

DISTANCE
2013 PLVC Research
CVI- Visual Acuity

- Of 166 students in study:

<table>
<thead>
<tr>
<th>Visual Acuity</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP</td>
<td>40</td>
</tr>
<tr>
<td>Fixes on large high contrast objects with/without movement</td>
<td>52</td>
</tr>
<tr>
<td>Smaller objects, faces @ near</td>
<td>28</td>
</tr>
<tr>
<td>&gt;6/60-6/120</td>
<td>22</td>
</tr>
<tr>
<td>&gt;6/18-6/60</td>
<td>24</td>
</tr>
</tbody>
</table>
Distance acuity is measured as a Snellen equivalent. Testing is notated at a 6 metre testing distance. 6/6 is normal vision. (US 20/20) That is the smallest sized letter which a person with normal sight can see clearly at 6 metres.

The bottom number is the distance that a person with normal vision can still recognise.

So the higher number at the bottom of the fraction the poorer the vision.

Ed Qld supports students who have a measured or estimated visual acuity of 6/18 or worse.
Visual Acuity

- Clinic
  - Threshold
  - Classroom
    - Function ✔
Visual Fields
Hemianopia
Refractive Errors & Correction
Refractive Errors & Correction

Myopia  Rx -  Hypermetropia  Rx +

- Shortsightedness
- Longsightedness
Refractive Errors & Correction
Refractive Errors & Correction

astigmatism
Astigmatism
CVI Incidence of Refractive Errors

PLVC research 2013

38% of students with CVI were identified as having a significant refractive error.
"Normal" Vision