6.2 Vision assessment

6.2.4 Distance vision testing (using Lea Symbols Chart)

Aim
To identify amblyopia and unequal refractive errors in young children using the 15 line Lea Symbols Chart.

Background
Alignment of the eyes during the early years of life is considered critical for development of binocular vision. Amblyopia is a condition that occurs when there is altered visual input or abnormal binocular interaction resulting in diminished vision in one or both eyes. Strabismus is the most common cause of amblyopia and is the term used to describe any anomaly of ocular alignment. It can occur in one or both eyes and in any direction. Amblyopia is unique to children but is preventable if the child receives adequate treatment in childhood. The prevalence of amblyopia is approximately 1% - 4% of preschool children. The Lea Symbols Chart has been shown to have a high sensitivity for amblyopia. Vision development is said to be complete by the time the child is eight years of age, however some aspects of visual development will already be complete by the time the child reaches school age. The National children’s vision screening project conducted in 2008, recommended that a vision screen should be conducted for all children at around 4 years of age, with an allowable range from 3.5 to 5 years. In the community health setting, this is currently achieved by using the 15 line (3 metre) Lea Symbols Chart (#250100). The Lea Symbols Chart distance visual acuity test has been shown to be successfully used in 76% of children 3 years and over and more than 90% of children 4 years and over. For further information on vision refer to Community health policy guidelines:

- ‘3.7.1 Vision’, which includes information on development of vision; normal vision behaviours; vision problems; common vision defects, including strabismus; common eye disorders, including amblyopia; visual acuity tests; and rationale for vision screening.
- ‘3.8.12.2 Vision assessments in children- background’ which provides further information on assessment and evaluation; management and treatment; and referral.

Universal testing should be offered to all children from the age of 3.5 years as a component of the School Entry Health Assessment, usually in kindergarten. Targeted testing may be performed from 3 years of age if there are early concerns about eye problems or family history of amblyopia, myopia, hypermetropia or astigmatism. Children who are tested at age 3 years should still have their vision re-

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Next Review: 2016
NSQHS Standards: 1.7, 1.8
assessed in school when they are closer to 4 years of age. The Lea Symbols Chart may also be used to test the visual acuity (VA) of older children or adults who are not literate in English.

Key Points

- VA screening should be undertaken by staff with appropriate training only.
- Prior to performing the test, it is important to obtain a history from the parent/carer. The child health Personal Health Record, CHS 409 School Entry Health Assessment record and the Enhanced Aboriginal Child Health Schedule all contain questions which aim to highlight parental concerns about their child’s vision.
- The Cover Test and Corneal Light Reflex Test should be performed prior to the distance vision testing and contribute to the overall assessment of the eye.
- The Lea Symbols Chart consists of lines of four different symbols, arranged in combinations of five symbols per line. The symbols on each line are smaller than those on the line above. The Lea symbols should be presented as whole lines not isolated symbols, as the crowding phenomenon enhances the detection of amblyopia.
- The VA test is conducted initially with both eyes uncovered and then each eye is tested separately by occluding the other eye.
- Visual acuity screening does not exclude the presence of other treatable eye conditions, and a normal VA screening result may inadvertently deter the child or parent from seeking further review. The Lea Symbols Chart is a useful tool to assess visual acuity. However any child with a vision concern should always be referred to an eye health professional for more comprehensive assessment.
- VA screening for children with prescribed glasses:
  o Children who have had review by an ophthalmologist or optometrist in the past 12 months do not require vision screening.
  o Children who have not had a review within the past 12 months should have their vision tested wearing their glasses.
  o Children with glasses prescribed for reading only should not wear their glasses during testing.
- Community health staff should practice overarching infection prevention and management. Hand hygiene is to be performed at all appropriate stages of the procedure.

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Equipment

- 15 line (3 metre) Lea Symbols Chart (#250100) and the 4 symbol Lea recognition card/s.
- Pointer for Lea chart.
- Tape measure and marker.
- Two pairs sunglasses with one lens removed and the other occluded, or some other eye occluder.

Procedure

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| 1. Engagement and consent:  
- Explain the procedure to the child, and parent/carer if present. Allow sufficient time for discussion of concerns.  
- Ensure either written or verbal parental consent has been obtained prior to proceeding with testing if parent/carer is not present.  
- Refer to ‘Special circumstances’ section in 4.4.2 School entry health assessments guideline or 4.2.4 Early detection sub-policy if screening is indicated and consent not able to be obtained for a school aged child. | Encourage parent/carer support and involvement with the procedure where appropriate.  
If obtaining verbal consent, discuss with the parent/carer whether they consent to sharing of information with relevant school staff.  
Section 337(1) of the Health Act 1911 authorises nurses specified in the schedule to examine a child without parent consent if required. |
| 2. Preparation:  
- Stand or sit the child comfortably, with an accurately measured distance of 3 metres from the child’s eyes to the chart, to ensure validity of testing.  
- Observe the child’s eyes, head posture and alignment while child is in a relaxed state.  
- Place the Lea recognition card/s in front of the child and establish a method of communication with the child. | It is recommended to seat the child at a small table if possible.  
Ensure adequate room lighting. Room should be well lit and the light should be dispersed evenly throughout the area of testing.  
Note any abnormalities with the child’s eyes.  
Abnormal head posturing may indicate a visual difficulty.  
In the school environment children are often screened in pairs. This has been shown to encourage confidence in the
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<tr>
<td>• Show all the symbols to the child to ‘practice’ before using the chart. The child should respond by either naming the shape or pointing to the same shape on the key card.</td>
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<td>• When testing 3-year-old children, introduce the chart close to the child after practicing matching symbols.</td>
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<td>• For school aged children, practice with the symbols and then switch directly to the 3 metre chart.</td>
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<td>Always test well within the visual sphere of the child. If the child loses interest and you cannot re-engage them, abort the test and recheck at a later date.</td>
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<td><strong>3. Testing strategies:</strong></td>
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<td>• During testing, it is acceptable to briefly point to the symbol using a pointer.</td>
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<td>• Continue with the testing until the child is not able to correctly identify at least 4 symbols in one line.</td>
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<td>Do not leave the pointer close to the symbol because it makes fixation easier, especially in the case of amblyopia.</td>
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<td>Do not isolate symbols.</td>
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<td>Skipping symbols may be a sign of other vision anomalies but is not a finding that requires follow-up or referral if noted in isolation.</td>
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<td><strong>4. Testing process:</strong></td>
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<td><strong>Binocular vision</strong></td>
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<td>Always test binocular vision first.</td>
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<td>• Briefly point to some of the larger symbols in descending order and ask the child to name the shape or match the correct symbol on the card in front of them.</td>
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<td>• If the child fails to identify a symbol, move up the chart to the next larger line. If the child is unable to identify symbols in this line continue up the</td>
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<td>Professional judgement may be used as to which size symbols to start familiarising the child.</td>
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| - chart until you find a symbol that the child can correctly match.  
  - Then move down the chart again until the child fails to correctly identify 4 out of 5 symbols on the line.  
  - Choose one of the smaller lower charts (starting from 6/12) to test the binocular visual acuity.  
  - Move down until the child hesitates or is unable to correctly identify 4 out of 5 symbols on that line.  
  - Children of all age groups should be tested to the 6/6 line or until they fail a line.  
  - Visual acuity is recorded as the last line on which at least 4 of the 5 symbols are identified correctly across the line.  
| When tested at 3 metres, the visual acuity value is found in the right side margin adjacent to that line.  
  The child may identify all the symbols as circles when they can’t recognise the shape. The child may perceive answering correctly, while the examiner detects the visual acuity threshold.  
  Alternatively, the child may hazard a guess when they are unable to see the symbol. Observation of the child’s behaviour should contribute to the clinical picture.  

5. Testing process:  
   Unilateral vision  
   Proceed to test each eye separately using the same progression as with binocular vision testing.  
   - Test the right eye first (occluding the left eye), unless there is an obvious negative response to this order of process.  
   - Use a different lower chart for each eye. This eliminates the risk of memorising.  
   - To pass a line, the child must correctly identify at least 4 of the 5 symbols in the line. The correctly enclosed eye must be completely occluded. When testing, watch the chart and the child. Children can be very skilful at subtly ‘peeking’ with the better eye.  
   Encourage the child to keep both eyes open during the testing.  
   Use clinical judgement to determine if re-familiarising the child is required for each component of the test. This will also depend on the individual practitioner’s skill and experience.  
| The eye not being tested must be occluded completely. When testing, watch the chart and the child. Children can be very skilful at subtly ‘peeking’ with the better eye.  
  Encourage the child to keep both eyes open during the testing.  
  Use clinical judgement to determine if re-familiarising the child is required for each component of the test. This will also depend on the individual practitioner’s skill and experience. |
### Steps

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<tr>
<td>identified symbols do not need to be consecutive. Continue testing across the smaller lines until 2 or more errors are made in a line or it is too difficult for the child to continue.</td>
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<tr>
<td><strong>•</strong> Repeat the procedure to test the left eye, covering the right eye, and test to the 6/6 line if the child is able.</td>
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### 6. Results:

- The child passes the test when visual acuity for each eye is 6/9.5 or better and there is less than a two-line difference between the eyes.

A VA of 6/19 or worse requires an urgent referral. If the VA is at or worse than 6/19 in either eye but there is a possibility that the results were unreliable, arrange a recheck within the same day or within one week of initial screen so that an urgent referral can be arranged.

### 7. Recheck process:

- All components of the vision assessment should be reassessed, including corneal light reflex and cover test.
- It may not be necessary to repeat the visual acuity binocular (VAB) on recheck unless this is useful to help re-familiarise the child.
- Staff may find it helpful to recheck the eye with the poorer visual acuity first and the better eye second.
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<td>8. Explain results to parent/carer (if present) or inform parent over the phone or in writing.</td>
<td>For outcome and referral pathway see below.</td>
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<tr>
<td>9. Documentation: Documentation of the Lea Symbols Chart should include the following descriptors:</td>
<td>Document findings in any one of the following as relevant:</td>
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<tr>
<td>• Test used - Lea chart, 15 line, 3m.</td>
<td>• Child Health- CHS 560 and Personal Health Record.</td>
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<tr>
<td>• Visual acuity - this is the smallest line where the child has correctly recognised at least 4 of the 5 symbols.</td>
<td>• School Health- CHS 409-2 or CHS 412 School health progress notes.</td>
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<tr>
<td>• VA is recorded as a Snellen notation equivalent e.g. 6/9.5, 6/6 (found in the right margin of the Lea Symbols Chart).</td>
<td>• CHS 142- Referral to Community Health Nurse.</td>
</tr>
<tr>
<td>• Record visual acuity binocular (VAB), visual acuity right eye (VAR), visual acuity left eye (VAL).</td>
<td>Documentation may include electronic records.</td>
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<td>• The number of line differences between the right and left eye visual acuity e.g. 0 or 1 or 2 lines difference. For example: VAR = 6/12; VAL = 6/7.5. This is a 2 line difference.</td>
<td>Note any additional observations e.g. ‘turning head when right eye covered’; or ‘reluctant to perform testing when left eye covered’.</td>
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<tr>
<td>10. The Lea chart should be stored with a sheet of paper placed between the surfaces. The chart should not be exposed to high temperatures. Avoid storing the chart in the boot of the car.</td>
<td>This may prevent ghosting of the images onto the other side of the chart over time. If necessary, the chart can be cleaned with a non-abrasive cleaner.</td>
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Outcome

No action is required if the child’s visual acuity is better than or equal to 6/9.5 in either eye and there is less than a two line difference between the eyes.

Recheck

Any child with any of the following results should be rechecked within three months:

- VA greater than 6/9.5 but less than 6/19 in either eye.
- A two line (or more) difference between eyes.
- If any other anomalies are observed during the assessment, clinical judgement should be used and the child monitored or referred. Eg: turning of the head during testing, reluctance to cover one eye, ptosis of eye, etc.
- Any child who is not attentive or not able to perform the testing. These children have been shown to have an increased likelihood of a vision problem.\(^7\)

Referral

Any child with any of the following results should be referred for ongoing assessment:

- Any child on recheck with a VA greater than 6/9.5 in either eye or if there is a two line difference between the eyes.
- Any child with a VA of 6/19 or worse in either eye requires urgent immediate referral. In this situation, discussion with the parents should highlight the necessity for the medical practitioner or optometrist to make contact with the ophthalmologist to arrange a timely appointment.

It is recommended that staff use the correct terminology when discussing any vision results with the parent or carer. The use of the term ‘lazy eye’ can be misleading as it can relate to several different eye conditions. A squint is a more accurate description.

If a vision concern is detected, inform the classroom teacher. This may include recommendations on seating or other strategies to support the child in the classroom whilst awaiting referral follow-up. A copy of the results should be provided to the teacher on completion of the health assessment.

Referral pathways

Where there are any vision concerns, signs of impairment, or any situation where community health staff is concerned that the results may not be within normal limits, the child should be referred to a medical practitioner for further assessment. Normal visual acuity findings do not exclude the presence of other treatable eye conditions.

It should be noted that the Lea Symbols Chart test aims to detect amblyopia. This is a medical condition which should be managed by an ophthalmologist. The CHS 663 - Referral from Community Health Services form should be used to refer the child to their medical practitioner or follow local service referral pathways to ophthalmology services. Community health staff should request in the referral that the medical
practitioner assess and advise parents regarding referral to an ophthalmologist. The CHS 418 - Information to Ophthalmologist from Community Health form may be completed by community health staff for the parent to give directly to the ophthalmologist once this appointment occurs. These forms will assist to facilitate monitoring of referral outcomes. Use of a reply paid envelope may help facilitate referral feedback.

Where ophthalmology services are limited or infrequently available, initial referral to an optometrist may be used as an alternative to expedite assessment, treatment or prioritising for ophthalmology services.

Always obtain parental consent for referral.

Referral feedback

It is recommended that when there is no feedback received from the medical practitioner and/or ophthalmologist that the referral should be followed-up with the parent or carer and outcomes carefully documented.

**Occupational Health and Safety Considerations**

There is a potential for the assessor to sustain musculoskeletal injuries when undertaking multiple vision testing using the Lea Symbols Chart. This is due to repetitive neck and trunk rotation movements made when alternating between looking at the child and the chart.

It is recommended that individual staff perform no more than 10 Lea tests per day. It is important to ensure community health staff rotates frequently between administering vision and hearing testing, following the same child through both procedures. This will provide an opportunity to gain a holistic view of each child and staff can also act on professional observation and judgement about aspects of health and development during the assessment.

Where possible, source a swivel chair and use this when performing Lea testing, this may be able to be negotiated in the School Level Agreement. A swivel chair will help reduce neck and/or neck and trunk rotation. If this is not possible, alternate between sitting or standing on the left or right side of the chart and switch using the pointer between the left and right hand.

Plan to complete the majority of kindergarten screening from Term 2 onwards, as the test will generally take less time and is more likely to be accurate with an older child.
Related policies, procedures and guidelines

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<td>6.2.3 Corneal Light Reflex Test (Hirschberg Test)</td>
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<td>6.2.5 Cover Test</td>
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Staff should also refer to any service specific policies where applicable.

Useful resources

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<td>Director - Statewide Policy Unit.</td>
<td>Birth to School Entry, School Aged Children.</td>
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References