

Child Visual Health and Vision Screening Protocol, 2018

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Preamble

The Ontario Public Health Standards: Requirements for Programs, Services, and Accountability (Standards) are published by the Minister of Health and Long-Term Care under the authority of section 7 of the *Health Protection and Promotion Act* (HPPA) to specify the mandatory health programs and services provided by boards of health.^{1,2} The Standards identify the minimum expectations for public health programs and services. Boards of health are accountable for implementing the Standards including the protocols and guidelines that are referenced in the Standards. Protocols are program and topic-specific documents incorporated into the Standards which provide direction on how boards of health shall operationalize specific requirement(s) identified within the Standards.

Purpose

The purpose of this protocol is to provide direction to boards of health on child visual health and **vision screening*** services to be offered in the school setting.

Reference to the Standards

This section identifies the standard and requirement to which this protocol relates.

School Health

Requirement 7. The board of health shall provide, in collaboration with community partners, visual health supports and vision screening services in accordance with the *Child Visual Health and Vision Screening Protocol, 2018* (or as current).

Operational Roles and Responsibilities

Pre-Screen Notification

- 1) In preparation for the school vision screening, the board of health shall:
 - a) Coordinate with schools to make prior arrangements regarding the screening dates, time and locations;
 - b) Ensure that notification is provided to parents/guardians of children in Senior Kindergarten (SK) at least 10 business days before school vision screening is scheduled to take place. This notification shall include information on:
 - i) The statutory authority under which vision screening is conducted;

* Terms marked in **bold** are defined in the Glossary.

- ii) The purpose of vision screening;
 - iii) The screening processes, including clarification that vision screening is non-invasive;
 - iv) Post-screening notification to parents/guardians;
 - v) The process parents/guardians should follow if they wish to opt out from vision screening; and
 - vi) A contact name and telephone number parents/guardians may call if they require additional information.
- c) Confirm that pre-screen notifications have been sent to parents/guardians; and
 - d) Reschedule the screening if pre-screen notifications have not been sent to parents/guardians before vision screening is scheduled to take place.

Vision Screening

- 2) The board of health shall:
 - a) Provide, or ensure the provision of vision screening by trained individual(s), as specified in Appendix A, for SK students in all schools annually.
 - b) Use vision screening tools, training, and methods as specified in Appendix A for the purposes of identifying some risk factors for the following:
 - i) **Amblyopia**;
 - ii) Reduced **stereopsis** and/or **strabismus**; and
 - iii) **Refractive vision disorder**.
 - c) Provide, or ensure the provision of vision screening at an alternate location as soon as reasonably possible, when requested by a parent/guardian and/or assist families in accessing an optometrist for a **comprehensive eye examination**.

Post-Screening Notification and Follow-Up

- 3) The board of health shall:
 - a) Notify the parents/guardians of children who have been screened and identified in need of visual health services and/or treatment within two business days of completing the screening. This notification shall be by mail, telephone discussion, direct contact, or by electronic communication where available, and shall include issuing a Parent Notification Form-A (PNF-A). This form shall include a referral to an optometrist for a comprehensive eye exam.
 - i) The board of health shall provide a reminder letter to all parents/guardians of children identified in need of visual health services and/or treatment within 20 business days of the date of screening, to book an appointment with an optometrist for a comprehensive eye examination.
 - b) Notify the parents/guardians of all other children who have been screened. This notification shall be by mail, telephone discussion, direct contact, or by electronic

communication where available, and shall include issuing a Parent Notification Form-B (PNF-B). This notification shall encourage parents/guardians to book an appointment with an optometrist for a comprehensive eye exam.

Visual Health Navigation

- 4) To support awareness of, access to, and utilization of visual health services, the board of health shall:
 - a) Support children and their families to improve their awareness about visual health, including the importance of early identification of vision disorders, through health promotion and targeted outreach to priority populations and/or communities;
 - b) Promote awareness of school-based vision screening, OHIP-covered comprehensive eye examinations, and available visual health services through health promotion and targeted outreach to priority populations and/or communities;
 - c) Utilize referral networks in order to assist families in accessing an optometrist to conduct a comprehensive eye examination;
 - d) Assist families with accessing appointments and treatment as needed; and
 - e) Increase awareness of available visual health services among community partners and providers.

Data Collection and Analysis

- 5) The board of health shall:
 - a) Collect and record vision screening data as specified in Appendix A as screening occurs or at the first opportunity post-screening; and
 - b) Analyze and interpret vision screening data as specified in Appendix A.

Glossary

Amblyopia: The medical term used when vision is reduced and not correctible to a normal level with optical devices. This condition is also sometimes called “lazy eye”. There are a variety of causes of amblyopia, including strabismus and anisometropia.”³⁻⁶

Comprehensive Eye Examination/Periodic Oculo-Visual Assessment: As set out in the *Schedule of Benefits*, a comprehensive eye exam/periodic oculo-visual assessment is an assessment of the eye and vision system that includes: the diagnosis, treatment and prevention of disorders of refraction, sensory and oculomotor disorders and dysfunctions of the eye and vision system, and eye disease. This service includes all components required to perform the assessment (ordinarily a history of the presenting complaint, past medical history, visual acuity examination, ocular mobility examination,

slit lamp examination of the anterior segment, ophthalmoscopy, tonometry) advice and/or instruction to the patient and provision of a written refractive prescription if required.⁷

Refractive Vision Disorder: A vision disorder in which the shape of the eye prevents a person from focusing well. The cause could be the length of the eyeball (longer or shorter), or changes in the curvature of the cornea or the lens. Common refractive errors are:

- Myopia, or nearsightedness: A disorder where there is clear vision close-up, but blurriness in the distance;
- Hyperopia, or farsightedness: A disorder in which distant objects can be seen clearly, but close ones do not come into proper focus;
- Anisometropia: A difference in refraction between the two eyes;
- Astigmatism: A disorder caused by abnormality in the curvature of the cornea and/or the lens; and
- Presbyopia: A disorder where there is an inability to focus close-up as a result of aging.³⁻⁶

Stereopsis: The ability to visually recognize depth based on differences in the images created on the two eyes. Stereoacuity is a measure of the smallest difference in the two images that can be resolved as a single image in depth.⁶

Strabismus: A disorder in which both eyes do not line up in the same direction, so they do not look at the same object at the same time. It is characterized by the misalignment of the visual axes of the eyes that affects **binocular vision** and depth perception. This results in one or both eyes turning inwards, outwards or upwards. The condition is more commonly known as "eye turn". A common form of strabismus is esotropia (the in-turning of one or both eyes).³⁻⁶

Vision Screening: A relatively short sequence of tests that can detect some potential risk factors of certain vision disorders. A vision screening cannot diagnose vision disorders nor is it a replacement for a comprehensive eye examination conducted by an optometrist. Vision screenings may indicate when a referral to an optometrist is necessary, but a comprehensive eye exam is a more fulsome assessment of the eye and vision system.^{3-4,6}

References

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Appendix A: Vision Screening

Context

Vision screening under the *Child Visual Health and Vision Screening Protocol, 2018* includes a short sequence of tests that can detect risk factors for certain vision disorders. The vision screening tools which are the focus of this appendix are as follows:

- a) HOTV visual acuity chart with crowding bars;
- b) Randot Preschool Stereotest; and
- c) Autorefractor

The HOTV visual acuity chart with crowding bars is a chart that tests visual acuity, otherwise known as the sharpness of one's eyesight/clarity of vision. Visual acuity is expressed as a fraction, such as 20/20. Having 20/20 vision means that one can see at 20 feet what a person with normal vision can see from that distance. 20/40 means that one can see clearly at 20 feet what a person with normal vision can see from 40 feet. Each eye is tested separately, while the other eye is occluded.

In addition to visual acuity, this screening test is also designed to identify children at risk for the following vision disorders: amblyopia and refractive errors (e.g., myopia, anisometropia and astigmatism).

The HOTV visual acuity chart with crowding bars may look like this:



The Randot Preschool Stereotest (Randot) is a vision test designed to detect reduced stereopsis/stereoacuity at near distances. Stereoacuity is the ability to visually recognize depth based on differences in the images presented to the two eyes. The test measures the smallest depth difference that can be detected and is a measure of binocular function.

In each test booklet, the left-hand page shows two-dimensional black-and-white silhouettes of two sets (panels) of four test shapes. Each panel tests a different disparity. The right-hand page contains two sets of four random-dot patterns in different sequences than those that are on the left-hand page. In each set of random-dot patterns, one contains no test shape, while the remaining contain three of the test

shapes. While wearing Stereoglasses the child must correctly identify at least two of the three test shapes at each disparity level.

The Randot screening test may look like this:



An autorefractor is a lightweight, portable, handheld screening device that is easy to administer and is objective, thereby eliminating the need for the child to respond. It automatically screens for, and can identify the presence and size of some refractive errors, including near and farsightedness (myopia/hyperopia), astigmatism (asymmetrical focus), and anisometropia (unequal power between eyes).

There are a variety of lightweight screening autorefractors available, which may look like this:



Vision screening cannot diagnose vision disorders, nor is it a replacement for a comprehensive eye examination conducted by an optometrist.

Required Approaches

Vision Screening Training

- 1) The board of health shall ensure that all individuals who provide vision screening in accordance with Requirement 7 of the School Health Standard are in compliance with the *Child Visual Health and Vision Screening Protocol, 2018* (or as current) including this Appendix, and have completed the ministry-specified training.

Vision Screening Tools

- 2) The board of health shall use the following three (3) vision screening tests for providing or ensuring the provision of vision screening by trained individuals for SK students for the purposes of identifying some risk factors for amblyopia; reduced stereopsis and/or strabismus; and refractive vision disorder:
 - i) HOTV visual acuity chart with crowding bars;

- ii) Randot Preschool Stereotest; and
- iii) Autorefractor.

Vision Screening Methods

HOTV visual acuity chart with crowding bars (HOTV)

- 3) In conducting vision screening using the HOTV visual acuity chart with crowding bars, the board of health shall:
 - a) Obtain the following (or comparable) equipment and/or tools to use in conjunction with this screening test:
 - i) H.O.T.V. visual acuity chart with crowding bars;
 - ii) H.O.T.V. response (lap) card;
 - iii) Four separate training "H" "O" "T" "V" flash cards;
 - iv) Occluder glasses (or comparable – e.g., eye patches);
 - v) Pointer (e.g., pencil or pen);
 - vi) 10 foot measuring tape;
 - vii) Masking tape (to mark the distance);
 - viii) Chair for the child being screened; and
 - ix) If desired, chair for the screener at the 10 foot testing distance.
 - b) Consider the following steps in preparing for screening with this screening test:
 - i) Measure and mark the distance between the chart and the child to be screened with tape to ensure the distance is maintained throughout the screening session;
 - ii) Ensure there will be good lighting for the test cards;
 - iii) Begin with the flash cards close to the child. Ask the child to name or match the letters. Show the child the flash cards, but do not call the letters by name;
 - iv) Ask the child to match each flash card letter with one on the response panel (lap card);
 - v) When the letters can be named/matched without difficulty, the screening may begin. Note: recognition can usually be taught in a few minutes or less depending on the maturity of the child; and
 - vi) Move to 10 feet from the child and begin the test.
 - c) Use the following test procedure for this screening test, in accordance with manufacturer's instructions:
 - i) Conduct the test in a well-lit area/room;
 - ii) If the child wears prescription glasses, conduct the screening with the child wearing their glasses;
 - iii) Position the child's eyes 10 feet from the chart;
 - iv) Give the child the lap card to hold on their lap;
 - v) Test each eye separately, starting with the right eye;

- vi) Make sure the other eye is completely covered using the occluder glasses (or comparable – e.g., eye patches). Do not have the child cover the eye with his/her hand;
 - vii) Point to one of the letters on the chart. Ask the child to either name the letter or point to the matching letter on the response panel to indicate their choice. If the child is correct, test a second letter and have the child match it. There are four letters per level. The child must get three out of four correct to move on to the next level with smaller letters. Note: one of the cards may be repeated to give the child an extra attempt;
 - viii) Make sure the pointer is directly under the letter. To avoid damaging the chart, use only the non-marking end of a pen or pencil. Under no circumstance should the crowding bar line be disrupted; and
 - ix) The last size where three out of four test letters are correctly identified represents the child's visual acuity.
- d) Consider the following general principles for screening with this test:
- i) Maintain the distance during the test;
 - ii) Always watch to make sure that the child's head is kept straight and there are no signs of squinting;
 - iii) Make a game of the screening. Reassure the child that there is no right or wrong answers but encourage the child to do the best they can;
 - iv) If the child seems to understand the test but is hesitant, try testing the other eye. Then go back to the first eye;
 - v) If the child does not yet know the names of the letters or there is a language barrier, the screener may conduct the acuity test as a matching game, with the child referencing the response panel on their lap; and
 - vi) Encourage and praise the child e.g., "One more test to go, you're doing great!" "Good job!"
- e) Use the following thresholds for determining the screening result associated with this screening test:
- i) If the child obtains a result of 20/32 (or better) for O.D. and O.S., the screening result for this screening test is "PASS". Note that the board of health is not required to continue screening with this screening test if the child reaches and passes 20/32;
 - ii) If O.D. and/or O.S. are worse than 20/32, the screening result for this screening test is "REFER";
 - iii) If the child is unable or unwilling to do the test, then the result for this screening test is "UNABLE/REFUSE"; and
 - iv) Note: Individual eyes are referred to as:
 - I) O.D.: Oculus Dexter – Right Eye;
 - II) O.S.: Oculus Sinister – Left Eye; and

III) O.U.: Oculus Uterque – Both Eyes.

- f) Take appropriate routine precautions when conducting vision screening with this test, including adherence with current infection prevention and control practices and following care and cleaning general principles and manufacturers' instructions including use of a regular eye glass cleaning cloth to clean the cards and glasses between children, and, if using eye patch stickers, putting on a new patch each time.

Randot Preschool Stereotest (Randot)

- 4) In conducting vision screening using the Randot Preschool Stereotest, the board of health shall:
 - a) Obtain the following (or comparable) equipment and/or tools to use in conjunction with this screening test:
 - i) Randot Preschool Stereotest;
 - ii) Stereoglasses (plus 1-2 extra pairs including at least one pair of larger glasses for children with larger heads or children wearing glasses);
 - iii) Randot Preschool Stereotest copy of answers; and
 - iv) 2 chairs and a small table or desk.
 - b) Consider the following steps in preparing for screening with this screening test:
 - i) Ensure there will be good lighting for the test.
 - ii) Make a game of the screening. Explain to the child that you would like the child to look through a pair of "magic" glasses that lets you see things in the snow; and
 - iii) Have the child put on a pair of stereoglasses.
 - c) Use the following test procedure for this screening test, in accordance with manufacturer's instructions:
 - i) Conduct the test in a well-lit area/room;
 - ii) If the child wears prescription glasses, conduct the screening test with the child wearing their glasses during testing with the larger stereoglasses worn over top;
 - iii) Hold the book directly in front of you, about 40 cm from the child's eyes, under good lighting;
 - iv) In each test booklet, the left-hand page shows two-dimensional black-and-white silhouettes/shapes (possible answers for matching) and the right-hand page contains the test images (random-dot patterns). In each set of four random-dot patterns, one contains no test shape, while the remaining three contain test shapes. While wearing stereoglasses, ask the child to point to each square and say what he/she sees. The child must correctly identify at least two of the three test shapes at each disparity level in order to move on to the next level;

- v) Start with the largest disparity (800). Allow the child to adjust for a moment, waiting for objects to “pop out of the snow” before they indicate what is seen. If the child has trouble, ask the child to look for the items on the left hand side, but be careful that the child does not just choose the same sequence; and
- vi) After the child passes a level, proceed to the next level of difficulty until you get to 60 arcsec.
- d) Consider the following general principles for screening with this test:
 - i) Allow adequate time for testing. Some children may require additional time to adjust. Be patient and do not rush the child;
 - ii) Mark the books according to level/sequence of use;
 - iii) Start with “book 3” then go to “book 1” followed by “book 2”;
 - iv) Do not let the child see the booklets without wearing the stereoglasses.
 - v) Always ask questions the child can understand;
 - vi) If the child appears confused, try playing a matching game of matching the black-and-white pictures on the left hand side with the items “hiding in the snow” on the right hand side; and
 - vii) Provide encouragement and praise the child.
- e) Use the following thresholds for determining the screening result associated with this screening test:
 - i) If the child correctly identifies at least two of the three test shapes at 60 arcsec, the screening result for this test is “PASS”;
 - ii) If the child is unable to correctly identify at least two of the three test shapes at 60 arcsec, the screening result for this test is “REFER”; and
 - iii) If the child is unable or unwilling to do the test, then the result for this screening test is “UNABLE/REFUSE”. Note: if the child is unable to identify two shapes at 800 arcsec, then the result of this screening test would be “UNABLE/REFUSE”.
- f) Take appropriate routine precautions when conducting vision screening with this test, including adherence with current infection prevention and control practices and following care and cleaning general principles and manufacturers’ instructions including use of a regular eye glass cleaning cloth to clean the cards and glasses between children.

Autorefractor

- 5) In conducting vision screening using the Autorefractor, the board of health shall:
 - a) Obtain the following (or comparable) equipment and/or tools to use in conjunction with this screening test:
 - i) An autorefractor that is appropriate for use for children age 4-6 years; and
 - ii) 2 chairs.
 - b) Consider the following steps in preparing for screening with this screening test:

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- i) Consult the manufacturer's manual including with respect to the following requirements:
 - I) Recommended lighting for best results; and
 - II) Distance between tester and child;Set the referral criteria to match the referral thresholds indicated under section 5)e.
- ii) Note: Some autorefractors may be able to be pre-programmed to indicate specific thresholds of "PASS" or "REFER" based on the threshold criteria specified in this document. The autorefractor manual will provide instructions to customize the device;
- iii) Ensure the device is fully charged on the screening day; and
- iv) Prepare chairs at the appropriate distance for the screener and child.
- c) Use the following test procedure for this screening test, in accordance with the manufacturer's instructions:
 - i) Conduct the test in a dimly-lit area/room;
 - ii) If the child wears prescription glasses, do not test the child with the autorefractor;
 - iii) Explain the process to the child – e.g., that "we will be taking a picture of your eyes" and to focus on the target with "big, wide eyes";
 - iv) Follow the procedure for reading and recording results, in accordance with the manufacturer's instructions.
- d) Consider the following general principles for screening with this test:
 - i) If there is a problem getting an image, ask that the child look surprised – e.g., tell a joke;
 - ii) When you are done, show the child the picture; and
 - iii) Provide encouragement and praise the child.
- e) Use the following thresholds for determining the screening result associated with this screening test:
 - i) The screening result for this screening test is "PASS" if each of the following criteria are met:
 - I) Sphere: the Sphere value (e.g., "DS" value) for both O.D. and O.S. is within the range of -1.5D to +1.0D (including the values of -1.5D and +1.0D);
 - II) Cylinder: the Cylinder value (e.g., "DC" value) for both O.D. and O.S. is within the range of -0.75D to 0D (including values of -0.75D and 0D); and
 - III) Difference in Spherical Equivalent (S.E.) between eyes: the absolute value of the difference in SE values between O.D. and O.S. is less than or equal to 1.5.
 - ii) The screening result for this screening test is "REFER" if any of the following referral thresholds are met:

- I) Sphere: the Sphere value (e.g., “DS” value) for either O.D. or O.S. is outside the range of -1.5D to +1.0D;
 - a. Note that values worse than -1.5D are suggestive of myopia and values greater than +1.0D are suggestive of hyperopia.
 - II) Cylinder: the Cylinder value (e.g., “DC” value) for either O.D. or O.S. is outside the range of -0.75D to 0D; and
 - a. Note that values worse than -0.75D are suggestive of astigmatism.
 - III) Difference in Spherical Equivalent (S.E.) between eyes: the absolute value of the difference in SE values between O.D. and O.S. is greater than 1.5.
 - a. Note that if the absolute value of the difference in SE values between the two eyes is greater than 1.5, it is suggestive of anisometropia.
- iii) If the child is unable or unwilling to do the test, or if the autorefractor is unable to get a value for the child, then the result for this screening test is “UNABLE/REFUSE”.
- iv) Note:
- I) Sphere: relates to the power of the eye, which determines hyperopia and myopia;
 - a. Negative numbers (-) suggest myopia (near-sightedness); and
 - b. Positive numbers (+) suggest hyperopia (far-sightedness).
 - II) Cylinder: is a measure of the power of astigmatism, or irregular focus of the eye;
 - III) Difference in Spherical Equivalent (S.E.) between eyes: refers to the difference in mean spherical power between the two eyes; and
 - IV) Refractive error is commonly measured in diopters (D).
- f) Take appropriate routine precautions when conducting vision screening with this test, including adherence with current infection prevention and control practices and following care and cleaning general principles and manufacturers’ instructions including storage of the screening tool in a warm/dry place and in a carrying case when not in use.

Determination of Final Screening Result

- 6) The board of health shall use the following thresholds for determining the **overall** screening result:
- a) If all three tests indicate “PASS”, the overall screening result is “PASS”;
 - b) If any one of the three tests indicate “REFER” or “UNABLE/REFUSE”, the overall screening result for the child is “REFER”; and
 - c) If a school official requests that the child be referred based on information they may have with respect to the child’s health, the overall screening result is

“Automatic Referral”, regardless of the screening results for the individual screening tests.

- 7) The board of health shall immediately refer children to an optometrist if the child has any of the following observable eye conditions:
 - a) The eye turns in or out;
 - b) The child has crusty or red eyelids;
 - c) The child has drooping eyelids;
 - d) The child has different size pupils or eyes;
 - e) The eyelids are swollen; and/or
 - f) The child has a pink eye(s), suggestive of conjunctivitis.

Vision Screening Data Collection

- 8) The board of health shall record the child’s vision screening data on the Screening Assessment Form for each individual screening test at the time of screening.
- 9) Immediately following the screening, the board of health shall complete the remainder of the Screening Assessment Form for the child, including the individual and overall screening test results.
- 10) The board of health shall collect and record the following vision screening data in the Oral Health Information Support System (OHISS) or as specified by the ministry at the time of screening or at the first opportunity post-screening:
 - a) Child’s name;
 - b) Address;
 - c) Date of birth;
 - d) Facility name;
 - e) Screening date;
 - f) Screener / Screening Coordinator;
 - g) Screening status (screened, absent, excluded);
 - h) Screening findings (results) for HOTV, Randot, Autorefractor, and Final Screening Result;
 - i) Date Parent Notification Form was sent;
 - j) Date reminder letter was sent (if applicable); and
 - k) Notes (as applicable).

