Functional Reading Acuity Screening Test (FRAST)

This is a practical screening test designed as a lower-cost alternative to the standardized commercially available reading acuity and contrast sensitivity tests that can cost well over $200. This test was designed for therapists and nurses to screen for disabled visual acuity, as well as to document functional problems using accurately sized images of practical reading tasks such as medication labels and warnings, package labels and bills. The FRAST is of standard letter size and thus easily fits into a carrying case. The glossy overlay cover not only protects the documents but also can be used to illustrate reflective glare when instructing a patient about lighting. The reading acuity test can be used to approximate magnification requirements for first response interventions such as simply enlarging the text.

This reading acuity test includes a low contrast line with compound words and numbers to better detect the impact of field loss and scotomas on performance. Because both high contrast and lower contrast acuity is included, the acuity chart is ideal for determination of optimal lighting for reading. Although the FRAST was designed so that each line is of approximately the same reading difficulty, phonological and literal length, these characteristics have not been validated. It is not recommended as a substitute for validated distance visual acuity tests administered by optometrists or ophthalmologists to screen for disease or refractive error. The validated standardized reading acuity tests are recommended for the low vision specialist for accurately estimating magnification.

Administration

1. The client wears clean glasses and looks through the bifocal or reading glasses. Determine the correct test distance for the client's reading addition, normally, 40 cm (16 inches) for a +2.50 diopter reading addition. If you do not know, ask the prescribing eye doctor. In the prescription for the reading glasses the reading addition is specified at the end. For example:

   +2.50 -1.25 X 090 /+ 2.50

   indicates a +2.50 addition. Distance in cm is 100/D where D is the reading addition in diopters.

2. Starting with the largest print size, instruct the client to read aloud the text and then the low contrast unrelated words and numbers on the last line. You may want to use a stopwatch to record the reading time for just the high contrast sentence.

3. Have the client read the next smallest text sample (next page or lower line).

4. Note when the client starts to slow down (reading time increases) and stumble over words when reading the high contrast sentence or starts to miss the words or numbers on the low contrast line. The line above, the larger text, is the ***Critical Print Size***. For example, if the client starts to slow down when reading the 1.6M line, the 2.0M is the critical print size. Ask the client

for a subjective impression of when the print becomes difficult to see to verify your estimate of critical print size.

5. Have the client continue to read smaller text. Make careful note of the errors and pauses as this reveals valuable information. If the client misses the end of words, a right field loss is suspected. If the client misses the beginning of lines or skips lines, a left neglect or left field loss is suspected.

6. The smallest print that is read and understood is the **functional acuity threshold**.

7. First test the client with both eyes, then cover each eye and ask if it is harder to see or about the same as with both eyes. If the client reports the print is not as clear with one eye, then retest the acuity in that eye. Here the actual acuity of the eye with lower acuity is usually not functionally important. As the client will memorize the test, it is OK to use subjective impressions to determine which eye is better and if vision is better if the poorer eye is covered. If there is a significant difference, sometimes the client sees better with the eye with poorer vision covered. This indicates that the eye might be occluded during reading.

8. The **Critical Print Size** is usually the best print size for reading.

9. Results: **always record distance , print size and eye tested in meters.**

a. Distance/print size in meters (equivalent Snellen acuity) right eye, left eye and both eyes for critical print size (CPS) and acuity.
b. Example: Acuity: 0.4/1.6M (20/80 equivalent) right eye, 0.4/4M (20/200 equivalent) left eye. 0.4/1.6M both eyes. Critical Print Size: 0.4/3.2M both eyes.

Lighting Evaluation

This can be incorporated into the acuity test and used as patient education.

1. Start with normal overhead room lighting, or typical lighting a client might use if at home. Ask if the lighting is OK. If the client asks for better lighting and indicates he or she knows how to adjust lighting, then additional instruction is not necessary.

2. Start administering the acuity test as above. When the client starts to slow down and stumble, then position a directional lamp or a strong (greater than 100 lumen) flashlight to the side to eliminate reflective glare and then move the light closer to the page increase the illumination of the reading material. Usually the client's reading will improve. The is usually a good time to educate the client about light positioning and how to change illumination on the page by simply positioning a light.

3. At acuity threshold increase and decrease the light until an optimal range of illumination is determined. The use of a photometer is recommended to record the illumination.

Functional Reading Material

The FRAST includes actual size reproductions of medication labels and warnings, packaging, bills and package instruction. These materials are often on boxes and containers and can be difficult for a therapist to carry. They can be supplemented with reading materials that are printed on flat pages such as menus, price tags and reading materials for your facility such as an activity schedule. Religious materials and texts are often of interest to clients. Using these materials you can quickly document functional reading performance before and after an intervention or device is tried. Usually a percentage word accuracy measure is used to measure performance.

For more information on functional reading testing we recommend:

Whittaker, SG, Scheiman, M., Sokol-McKay, D. Low Vision Rehabilitation: A Practical Guide for Occupational Therapists. (2016) Slack.

For the general practitioner screening for vision disability, we recommend: Introduction to Low Vision: First Response Interventions (a 7 hour online CE course available at www.visionedseminars.com)