

Practical Near Acuity Chart Design Features

Bailey and Lovie (1976) advocated that the reading task of a near chart should be essentially the same at each print size level. It is important that reading cards cover a wide enough range of reading sizes to encompass those with good and poor vision. The progression of print sizes should be regular, the logarithmic scale being preferred (Sloan, 1957; Bailey and Lovie, 1976). The separation between successive lines should be in relation to the acuity size of the print to maintain the resolution demand of the words. Also, the number of words and letters on each line should be kept constant to maintain the lines as an equivalent task and to keep variability at a minimum (Raasch et al., 1998). The PNAC was designed to incorporate these important acuity chart features:

1. Encompasses print sizes from large (N80, such as newspaper headlines) to small (N5, such as a telephone directory entries). Print sizes smaller than N5 were not included to avoid demoralisation of patients (at seeing how many lines they are not able to read) and due to the practical irrelevance of smaller sizes of print. Near acuity threshold cannot be measured by the PNAC for normally sighted observers therefore, due to floor effects.
2. A regular decreasing progression of print size and line spacing (0.1 logMAR) was used. "N point" notation was used as well as logMAR notation as it specifies a size and is thus independent of distance (which should be recorded alongside the N point). M units (1M is equivalent to N8) devised by Louise Stone (1963) were also included.
3. Equal numbers of words were used on each line (one three, one four and one five letter word). Thus each line has an equivalent task demand having 12 letters split into 3 words. It is suggested that the five letter word should be scored at 0.04 logMAR, with the four and three letter words scored at 0.03 logMAR (adding to 0.10 logMAR units for each line).
4. Related words sequences were established to make the task of establishing a near acuity threshold less onerous, more practical and relevant. Using related words in a near chart was shown to give a similar acuity threshold to using un-related words (Wolffsohn and Cochrane, 2000). Several word sequences for the chart have been printed to prevent learning effects with repetition.
5. The words used are easy to recognise by children (chosen from internet English word lists to be in the vocabulary of children in grade 4, aged 9, and above) and those with poor language

and cognitive skills. Patients with poorer English (such as immigrants) appear to struggle with longer, less commonly used English words such as the 10 letter words found on the Bailey-Lovie near chart.

6. The PNAC uses "Arial" font as it has limbs of a regular size and was designed to have a high level of legibility and proportionality. Lower case letters were used and punctuation excluded to minimise irregularities in acuity demand and clutter.
7. Paragraphs of the most commonly used print sizes are located on the reverse side of the chart so reading a set size of print can be practiced once the near acuity threshold has been established. These passages can be used to determine reading speed and fluency.