EYE HEALTHCARE

DYSLEXIA AND THE COLORIMETER

Visual Stress

Many children and adults suffer from visual discomfort when reading, which can affect fluency, concentration and can cause rapid fatigue. This is generally seen as a 'movement' (shimmering) of the print on the page causing headaches and eyestrain. This phenomenon is termed 'Visual Stress' and is found to exist in dyslexia, photosensitive migraine, photosensitive epilepsy, autism and ADHD. It typically affects 20% of the population, with 5% of the cases being severe.

For children in particular it is very important to diagnose 'Visual Stress' problems early, since their inability to read causes frustration, loss of self-esteem and poor performance at school in these crucial formative years.

The Use of Colour

It is thought that this discomfort when looking at the print is due to a hyperexcitability of the neurones in the anterior visual cortex (the part of the brain that processes vision), but these neurones are also colour sensitive – so by placing a very specific colour in front of that individual's eye, this pattern of excitation can be changed. In other words the colour will help to slow and calm these cells, therefore quieting the pattern and reducing the visual stress. This whole discovery on colour started in the 1980's and early 1990's by Olive Mears (New Zealand). Helen Irlen (USA) and Prof. Arnold Wilkins (UK).

The Examination

The first thing we recommend is a full eye examination with particular emphasis on how well the eyes work together. After any appropriate spectacles or exercises have been prescribed, and if the symptoms are still present, then an assessment using spectral overlays (coloured transparent acetate sheets) are used. These coloured sheets are used as a screening test only to give an indication if colour will be beneficial to this person. (Their accuracy falls down as the person's eyes are adapted to the surrounding illumination and colour of the room, as opposed to being adapted to a precise colour of a lens held up to the eye – this will nearly always give a different colour of spectacle tint prescribed relative to the chosen overlay).

If colour apparently helps the individual, we move on to the Intuitive Colorimeter. This is an instrument which allows text to be viewed under different coloured light scenarios. The hue (colour), saturation (how deeply coloured) and brightness can all be altered by tiny increments until a precise shade is found which helps the individual by minimising or eliminating their symptoms.

The machine works by having a unique cylindrical mechanism inside, made up of seven specifically coloured filters and one large uniform grey filter – enabling up to 110,000 shade possibilities. This gives a very precise and tailored result for everyone being tested.

Trial coloured lenses are then used to match the chosen colour and 'Rate of Reading' tests carried out to confirm findings. Coloured spectacles, either with or without a prescription lens can then be ordered.

The mixing of light to create different colours and shades is in itself a science, where for example, yellow is created by mixing red and green lights – but if we alter one of these colours slightly, hue, saturation and brightness all change. The colorimeter overcomes these problems and enables colour and saturation to be varied without a change in luminance. Also the internal matt white walls of the unit, where the light is internally reflected, has a great ability to mix colour.

Early Recognition

The early identification of visual stress which can coexist quite closely with dyslexia is so important in the developmental years. Many who suffer from Visual Stress are often quite unaware that they see the page differently from others, until someone applies an appropriate coloured overlay or tinted lenses in front. They then say how the words 'stop moving' and the page appears 'clear and still'.

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