

Intuitive thinking

As the first optometrist to use a colorimeter in practice over two decades ago, Dr Simon Barnard speaks to *OT*'s clinical editor, Ian Beasley about the experience

DR SIMON BARNARD (pictured right) seems to make a habit of being first on the scene. He was responsible for developing the first GOC-accredited supplementary prescribing course in the UK, is a founder member of the European Academy of Optometrists, and more recently, has been a key figure in developing a novel clinical tool for the detection and monitoring of strabismus. It was 20 years ago though when he spotted the clinical potential of the intuitive colorimeter.

Humble beginnings

Once considered to be a niche area of optometry and viewed with scepticism by some, the use of a colorimeter to prescribe precision tints to alleviate visual stress has become widespread, with more than 400 instruments in the UK and over 150 in many other countries in the world. Visual stress, or Meares Irlen syndrome as it is known, manifests as undesirable perceptual effects, which can



be detrimental to reading and other visual tasks. The condition is thought to affect up to 5% of the population to a significant degree and 20% to a lesser extent, but using a precise tint or coloured overlay can alleviate the symptoms.

Back in the early 1990s, Dr Barnard attended an inaugural seminar held by the inventor of the intuitive colorimeter, Professor Arnold Wilkins, which was hosted at the Institute of Optometry in London. Recalling how he volunteered to sit as a patient during the event, Dr Barnard explained: "Despite not suffering from any discernible visual perceptual problems, I was intrigued by the concept on offer and surprised by the improvement to the clarity of text obtained using an optimal colour." Drawing upon his teaching experience in the paediatric clinic at City University London, he clearly recognised the potential of such a device to remove possible barriers to learning and ordered an instrument there and then, becoming the first practitioner to use a colorimeter in a routine clinical setting.

Growing support

A strong evidence base validates the use of the intuitive colorimeters in clinical practice, supported by numerous publications in well-respected journals. The instruments are now found in every

Image: Colorimeter (Cerium)



university optometry department in the UK. The device allows the practitioner to independently manipulate hue, saturation and brightness, producing a specification for a precise tint which alleviates visual stress in susceptible individuals. The colorimeter is used under the direction of an optometrist with an examination taking around 20 to 30 minutes. The practitioner presents colours to the patient in a logical order to produce a precise tint which offers optimal relief of perceptual distortions.

Today, Dr Barnard is the principal optometrist at Barnard Levit Optometrists in London. In addition, he is a visiting associate professor at the Department of Optometry and Visual Science, Hadassah College, Jerusalem, and director of ocular medicine at the Institute of Optometry, London. Having built his reputation early on in the field, Dr Barnard receives referrals from a variety of sources. "I often see children in my clinic with learning difficulties sent by educational psychologists, special education needs co-ordinators and occupational therapists," he said. However, he is quick to stress that "it is essential that patients undergo a comprehensive eye examination, including a thorough assessment of binocular vision status to exclude other causes of difficulty, before exploring the possibility of visual stress." In addition, he notes that "special attention should be given to performing a careful cover test, along with measures of associated phorias, stereopsis, fusional reserves and accommodative function, including amplitude, lag and facility."

Dr Barnard pays particular attention to patient history. "The key is to listen carefully to the symptoms, ask the right questions about headaches, and explore any issues which the patient may have with the clarity or stability of print." He also advocates a protocol of allowing patients to trial coloured overlays for several weeks before prescribing precision tinted lenses using the intuitive colorimeter.

Not just for reading difficulties

Although the majority of Dr Barnard's patients seeking visual stress assessments are children with specific learning difficulties, including dyslexia, the

The inventor behind the technology

In the early 1990s, Professor Wilkins, from the department of psychology, University of Essex, became aware that coloured filters were being used to alleviate visual perceptual anomalies in children with specific learning difficulties. He noted during his research that many subjects with photosensitive epilepsy shared symptoms in common with these children. Recognising the wider potential for using colour, but concerned that the benefit may be due to a placebo effect, he began to develop a rigorous evidence base, culminating in his theory of visual stress and the design of the intuitive colorimeter.

In 1994, Professor Wilkins published the first double-blind placebo-controlled trial to show that using colour to reduce anomalous visual distortions was more than just a placebo effect. He noted that high-contrast, printed text was often of a spatial frequency sufficient to elicit undesirable visual perceptual distortions in susceptible individuals. This led to the proposal that these effects could arise from hyper-excitability of the visual cortex and that the pattern of excitation could be modified with the use of a precise tint, owing to the colour-coding nature of cells within this area of the brain. Credible evidence to support this theory was published in 2011, following collaboration between Professor Wilkins and researcher at Michigan State University, demonstrating reduction to cortical hyperexcitability within the visual cortex when viewing visually stressful patterns through precision tints.

optometrist has had success treating other types of patients. He explained: "The precise nature of the tints we can prescribe using the colorimeter allows us to address visual perceptual disturbances arising in patients with migraine, photo-sensitive epilepsy and symptoms resulting from head injury."

One of the biggest frustrations Dr Barnard cites is the lack of funding from the NHS for patients requiring help with visual stress. On a positive note, he said: "There are funding streams available

for individuals undertaking a degree course of up to a maximum of £275 to contribute towards the cost of colorimetry and the supply of precision tinted lenses."

In conjunction with the Open University, the Disability Students Awards Service has established a system whereby students impeded by reading problems or specific learning difficulties, are able to attend educational assessment centres across the UK to consider their eligibility for an award on an individual basis.

Five tips for the practitioner

- 1 **Eliminate other potential causes of visual symptoms first, for example, refractive error or binocular vision anomaly**
- 2 **Assess the potential benefit of using colour by allowing the patient to trial overlays for a few weeks before considering colorimetry**
- 3 **Symptoms to look out for include:**
Movement of print, Blurring of print, Light-sensitivity, Letters changing shape or size, Patterns running through the text, Illusions of colour surrounding letters or words
- 4 **Signs to watch for include:**
Using a finger as a marker, Skipping words and lines, Rubbing eyes and excessive blinking, Low self-esteem
- 5 **Consider funding opportunities:** up to £275 is available from the Disability Students Awards Service for the provision of colorimetry assessments and the supply of precision tinted lenses for degree-level students.