

Critique of “Learning Disabilities, Dyslexia, and Vision”

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Introduction

This critique is of a Joint Technical Report by Handler, Fierson, and the Section on Ophthalmology and Council on Children with Disabilities, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus, and American Association of Certified Orthoptists in 2011.¹ This seems to be a revision of an earlier document, which is a joint statement by the same organisations.² The published report¹ is more detailed and is the document upon which this critique is based.

Background

Some awareness of the politics of eyecare in USA is required to understand the context of the joint report. The two main eyecare professions are ophthalmologists, who are medically qualified doctors who have specialised in eyes, and optometrists (also called doctors in USA). In the UK there are far fewer ophthalmologists than optometrists and nearly all ophthalmologists work in hospitals, treating eye diseases with medicines and surgery. In the UK, most optometrists work in community practices, providing primary eyecare, and generally the two professions have a reasonable working relationship. In the USA, proportionately, there are many more ophthalmologists, with a considerable number working in primary care. This, combined with the more commercial nature of healthcare in the USA, has led to competition between the two professions and often a considerable degree of animosity.

It seems that the speciality where this animosity is greatest is in the management of children with specific learning difficulties (SpLD; in the USA called learning disabilities) such as dyslexia. In the USA many optometrists prescribe vision therapy for a high proportion of these individuals, often following the philosophy of behavioral optometry (BO). The ophthalmologists tend not to follow this philosophy. In the UK, BO has not gained widespread popularity, perhaps because of a lack of a sound evidence-base.³⁻⁶ Most UK optometrists who specialise in visual factors that co-occur with SpLD are much more conservative in their use of vision therapy.

In USA, the issue of vision and SpLD has become a battleground between ophthalmologists and optometrists. In 1992 the ophthalmologists' viewpoint was exemplified in a statement published by the American Academy of Pediatrics, American Association for Pediatric Ophthalmology and Strabismus, and American Academy of Ophthalmology which included a section on “controversies”, describing the activities (e.g., vision therapy) typical of USA optometrists working in this field.⁷ The political nature of this document is evident, for example, in the statement: “Ocular defects should be identified as early as possible and, when correctable, managed by the **ophthalmologist**” [bold text by the present author]. It is notable that there is no mention of the other primary eyecare profession (optometry), or use of a generic term such as eyecare practitioner. The authors seem to view optometry as a competitive discipline that they wished would go away rather than as a fellow eyecare profession.

This document was followed by publication of a joint statement by the American Academy of Optometry and American Optometric Association, essentially refuting the ophthalmological statement.⁸ To a reader from the UK the optometric joint statement, like the ophthalmology joint statement, seems to take a partisan approach in wishing to exclude the other profession. For

example, the optometry joint statement says “People at risk for learning-related vision problems should receive a comprehensive optometric evaluation”, whereas in the UK more inclusive language would typically be used, such as “a comprehensive eye examination by an eyecare professional”. Both joint statements cite published papers which are said to support their views.

The views of most eyecare practitioners in the UK are, in the present author’s opinion, somewhere between the two extreme views represented in the opposing joint statements.⁹ The present document is a critique of the latest of these ophthalmology statements,² concentrating on the issue of Meares-Irlen Syndrome/Visual Stress (MISViS).

The ophthalmology statements have, since the first,⁷ been dismissive of the use of tinted lenses to treat MISViS, adding these to the list of “controversial” interventions. Again, a historical perspective is required to understand the context. One of the earliest descriptions of the benefit from coloured lenses for people with dyslexia was by a British neurologist,¹⁰ but the first person to establish a business based on this intervention was an American psychologist, Helen Irlen.¹¹ Irlen established franchises throughout the USA and received widespread media coverage for her treatment of MISViS, which she said could not be corrected with tinted lenses from “vision specialists”.¹² Irlen said that the condition affects two-thirds of people with dyslexia,¹² although later research indicates that this is an overestimate.¹³ Irlen’s approach antagonised ophthalmologists and optometrists in the USA and resulted in many refusing to even consider that MISViS may exist. It is not surprising that, in this climate, the first ophthalmology joint statement added MISViS to the list of controversial approaches.⁷

Irlen’s franchises spread to the UK, but when a respected British scientist invented an instrument for investigating MISViS which was patented by the Medical Research Council then this led to a different approach.¹⁴ The company that was licensed to manufacture this instrument, the Intuitive Colorimeter, was sufficiently restrained not to market the instrument before a randomised controlled trial had been completed and had validated the instrument and the use of precision tinted lenses.¹⁵ Shortly afterwards, the British College of Optometrists issued guidelines on the use of precision tinted lenses. Since then the Intuitive Colorimeter has become widely used by community optometrists and also in some hospital eye clinics in the UK.

The 2011 ophthalmology joint report

The 2011 ophthalmology report, like its predecessors, seems written to try to exclude any role for an optometrist. For example, when discussing the healthcare professionals who might assist in diagnosing and treating any health problems associated with SpLD the document lists every conceivable healthcare profession, except for optometrists: “Physicians, including general pediatricians, developmental/behavioral pediatricians, family physicians, neurologists, ophthalmologists, otolaryngologists, mental health professionals, and other appropriate medical specialists”.

In places, the document advocates practices which are typical of the care provided in the UK by optometrists: “Children with suspected learning disabilities in whom a vision problem is suspected by the child, parents, physicians, or educators should be seen by an [ophthalmologist] who has experience with the assessment and treatment of children, because some of these children may also have a treatable visual problem that accompanies or contributes to their primary reading or learning dysfunction. Treatable ocular conditions can include strabismus, amblyopia, convergence and/or focusing deficiencies, and refractive errors. Missing these problems could cause long-term consequences from assigning these patients to incorrect treatment categories.” This mirrors advice commonly issued to primary eyecare practitioners in the UK.^{9;16-19}

Indeed, many of the statements in the ophthalmology report are clear descriptions of current thinking in the UK. For example:

"In summary, vision problems can interfere with the process of reading; however, vision problems are not the cause of dyslexia."

"Thus, treatment of these disorders can make reading more comfortable and may allow reading for longer periods of time but does not directly improve decoding or comprehension."

"Because routine pediatric vision screening is not designed to detect problems with near vision, children with suspected or diagnosed learning disabilities should undergo a comprehensive pediatric medical eye examination by an [ophthalmologist] who has experience with the assessment and treatment of children, because some children may also have a treatable visual problem along with their primary reading or learning dysfunction." [In the UK, the word "ophthalmologist" would be replaced with "eyecare practitioner"]

"bifocals are rarely needed by children".

The document recommends good practice in interpreting the scientific literature:

"Although it is prudent to be skeptical, especially with regard to prematurely disseminated therapies, it is important to also remain open-minded."

However, when it comes to the use of coloured filters to treat MISViS the report¹ seems to ignore its own advice to be open-minded. For example, in a paper¹⁵ which the report acknowledges as "the first double-masked placebo-controlled study to test the effect of colored filters on symptoms of SSS [MISViS] and reading performance" the report states "Although the contribution of placebo effects was not entirely ruled out, this study's results suggested that some of the effects of colored lenses may not be entirely attributed to placebo." The authors of the joint report do not explain why they felt that the contribution of placebo effects were not entirely ruled out, and there were no criticisms published following the 1994 paper that questioned the placebo control in the trial. In any event, the joint report's acceptance that this study shows that precision tinted lenses are effective is a progression from previous versions of the joint statement, but unfortunately the conclusions of the joint report do not reflect this progression.

Another randomised controlled trial, by Robinson & Foreman,²⁰ is described in the joint report, but is misrepresented.¹ All the joint report says of this research is that it highlights the need for proper control procedures. This is true, but even with the use of proper controls in the Robinson and Foreman research these authors still found a statistically significant improvement in reading comprehension (and, at the $p=0.05$ level, in reading accuracy) when each participants' tint was changed from a control to the optimal colour.

The joint report also misrepresents research by Bouldoukian and colleagues:²¹

"In 2002, Bouldoukian et al. reported on subjects who experienced SSS symptoms while reading and concluded that colored overlays improved reading speed. However, the results also revealed that greater than one third of the subjects preferred the control filter and, overall, the subjects were not significantly more likely to prefer their colored overlay than the control filter."

Bouldoukian and colleagues compared reading speed using an individually selected coloured filter with a control UV-blocking filter and attempted to control for placebo effects by creating a cover story about the control filter being a special new research filter. The manuscript explains that the cover story was used to generate a similar placebo effect for the control filter to that associated with the coloured filters and the questioning about preference was used to check that this cover story was convincing. The manuscript makes it clear that the statistically significant improvement in reading with the coloured filter (c.f., the control) in the absence of a significant subjective preference is evidence that placebo effects were adequately controlled.

The joint report does not acknowledge that there is now a credible hypothesis for a mechanism underlying the benefit from precision tinted lenses in MISViS. This cortical hyperexcitability hypothesis, originally proposed by Wilkins,²² has been used to explain symptoms when reading²³ and the benefit from coloured filters.^{24;25} Recently (since the joint report was published), this hypothesis has gained experimental evidence from objective techniques, including fMRI²⁶ and near infra-red spectroscopy²⁷.

Summary

The Joint Technical Report seems to have been written with the intention of discrediting any approaches or interventions that are not currently mainstream ophthalmology. It is certainly not a balanced review and does not follow its own advice to remain “open-minded”. Compared with previous incarnations, the latest joint statement now acknowledges positive results from a randomised controlled trial of MISViS. It is unfortunate that this acceptance that the benefit from coloured filters is unlikely to be solely attributable to placebo effects is not indicated in the Abstract or Conclusions of the joint report, which remain a triumph of closed-minded cynicism over open-minded enquiry.

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