

The role of the optometrist in dyslexia

Part 2 Optometric correlates of dyslexia

This is the second in a series of three CPD articles which aim to give an update on the role of the eyecare practitioner in dyslexia. The articles are based on a recent book by the author¹.



ABDO has awarded this article
2 CET credits (GD).

Part 1 (OT 30/01/04) provided an overview of the specific learning difficulties, diagnosis of dyslexia, terminology, aetiology of dyslexia, types of dyslexia, non-specific learning difficulties, the role of visual symptoms and the evidence-based approach. This second part concentrates on the diagnosis and treatment of two fairly common optometric findings in dyslexia – binocular instability and accommodative insufficiency. It also discusses other optometric factors (e.g. refractive errors and visual fields), the magnocellular deficit, the Dunlop test, behavioural optometry, plus version eye movements and tracking.

The final part covers coloured filter treatments including syntonix phototherapy, Meares-Irlen syndrome, the Intuitive Colorimeter, mechanism for the benefit from colour, clinical protocol, and a comparison of available systems (Irlen, Intuitive Colorimeter, Chromagen, Tintavision, and Optopraxometer). Finally, some conclusions will be drawn on the role of the optometrist in dyslexia.

Optometric factors correlated with dyslexia

Binocular instability

Most research suggests that strabismus (heterotropia) is not a common correlate of dyslexia. Dyslexic people are more likely to have a problem associated with the binocular co-ordination in heterophoria. Specifically, one of the most frequent visual correlates of reading difficulties is binocular instability¹. This condition is characterised by low fusional reserves and vergence instability, and can result in blur, diplopia, visual perceptual distortions, and asthenopia². A key difference between binocular instability and decompensated heterophoria is that even patients who are orthophoric can still have the low fusional reserves and vergence instability characteristic of binocular instability.

In binocular instability, the vergence instability may be detected, for example, as an excessive movement of the arrow in the Maddox wing test. But the vergence instability is much more likely to be clinically significant if it occurs during the OXO test on the Mallett unit (Figure 1). During the Mallett unit OXO test, the two eyes are fully associated and fused so that the test creates similar viewing conditions to those which

would be present when the patient is reading. The test therefore has good 'face validity' for identifying binocular vision anomalies which are likely to interfere with the usual reading process.

Recent research³ has shown that the questions the practitioner asks during this test are crucially important. Quite commonly, the patient is just asked whether the Nonius markers (green strips) are lined up. Interestingly, many who answer yes to this question also answer yes to a supplementary question: "Do one or both of the lines ever move?" This latter question is the best way of identifying patients who are likely to have symptoms³. If one of the Nonius markers moves, then the direction of movement is identified, and the aligning prism or sphere is determined. This is the prism (base-in for an exo-slip) or sphere (negative for an exo-slip) which eliminates movement of the strip. The aligning sphere corrects a fixation disparity through influencing accommodative vergence. In cases where exercises are not appropriate, this can be a useful treatment.

The Mallett unit OXO test has been shown to have good sensitivity and specificity for detecting symptomatic heterophoria at near². It should be stressed that the test does not detect the full heterophoria, but rather the element which is decompensated. In presbyopes, if an aligning prism of 1Δ or more is detected then there are likely to be symptoms². If this is the minimum interval for correction, then it could be argued that the minimum step size for measurement should be less than this, i.e. 0.5Δ.

The sensitivity and specificity of the Mallett OXO test is good, but not perfect². So, other clinical tests are useful to help

» Figure 1
Mallett fixation disparity test



The College of Optometrists has
awarded this article 2 CET credits.
There are 12 MCQs with
a pass mark of 60%.

Module 1 Part 2 Dyslexia and vision

» About the author

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▶ **Figure 2**
Measuring fusional reserves
with a prism bar



▶ **Figure 3**
Institute of Optometry
Free-Space Stereogram (IFS) exercise
(reproduced with permission from
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determine whether binocular instability is present. In particular, fusional reserves should be tested in people with dyslexia. They can be assessed with a prism bar (Figure 2) or refractor head and at any distance. However, the near vision measurement is usually most relevant to dyslexia. Base-out prism is used to assess the convergent fusional reserve (which is used to overcome exophoria) and base-in to assess the divergent fusional reserve.

The fusional reserve which opposes the heterophoria should be measured first², and it is best to allow the patient two to three minutes for their binocular vision to stabilise between measuring different fusional reserves. The patient is instructed to fixate a detailed target and asked, as the prism is increased, to report if/when the target becomes blurred, when it becomes diplopic, and then (as the prism is reduced) when it returns to single. The practitioner should watch the patient's eyes to confirm their reports of diplopia and single vision.

The fusional reserve should be at least twice the phoria it opposes and if the amplitude (from divergent to convergent break points) is less than 20Δ , then this suggests that the patient may have binocular instability².

Binocular instability is easily treated with fusional reserve exercises⁴. For example, the Institute of Optometry Free-Space Stereograms (Figure 3) can be used

to train convergent fusional reserves⁵ – and the Adler dinosaur card* can be used to train convergent and divergent reserves. Randomised controlled research trials have shown that fusional reserve exercises are an effective 'evidence-based' treatment².

Accommodative insufficiency

A reduced amplitude of accommodation is an occasional finding in dyslexia, but only infrequently is the amplitude low enough to require treatment. As well as the usual testing of accommodative amplitude, accommodative facility testing is especially relevant if the child complains of trouble changing focus from the board to the book and vice versa. But flipper testing is prone to confounding variables, so it may be best not to base diagnosis on this test alone. Flippers are available from Paul Adler*. Accommodative lag, as assessed by MEM retinoscopy (Box 1), is a useful tool as it provides an objective estimate of how accurately the child is focusing on the page.

Accommodative insufficiency can cause symptoms of blurring and asthenopia. Treatment is by accommodative exercises, which are easy to do with flippers. The efficacy of exercises to train accommodation has been established with randomised controlled trials².

Optometric factors not correlated with dyslexia

Refractive errors

Refractive errors are probably not correlated with dyslexia, although a few studies have found a slightly higher prevalence of long-sightedness in dyslexia. Although refractive errors are not especially prevalent in dyslexia, all types of refractive error do of course occur in dyslexia as they can in any child.

Optometrists who specialise in specific learning difficulties encounter, from time to time, children with undetected high refractive errors. Occasionally, this can be the only cause of the child's learning difficulty and when the refractive error is corrected, the child rapidly catches up at school. In view of this, it seems absolutely incredible that a recent government publication actually advocates the lowering of the standard of vision screening in UK schools⁶.

Some practitioners argue that it is worth trying low-powered refractive corrections for people with dyslexia, in case they may help. However, the literature does not suggest that these are any more likely to help a dyslexic reader than they are a good reader. This is a controversial subject, with some people arguing that low refractive corrections will not do any harm and so are worth a try. On the other hand, there is some experimental evidence suggesting that dyslexic children are more likely to own spectacles which they do not use⁷, even though their refractive errors are similar to those of a control group⁸.

There is no strong evidence to suggest that refractive errors are a cause of dyslexia, so it seems unlikely that correction of small refractive errors would be especially helpful for people with dyslexia. It is probably best for practitioners to apply their usual criteria when deciding whether to prescribe refractive corrections for people with dyslexia. Exceptions to this may occur when there is a clinically significant accommodative or binocular vision anomaly, which would be helped by refractive correction, or when symptoms are present.

Ocular pathology

Fortunately, ocular pathology is rare in children, and it is not generally thought that any eye diseases are particularly likely to be present in dyslexia. Nonetheless, it should be acknowledged that some of the visual symptoms that can occur in dyslexia (e.g. headaches, blur, diplopia; Table 1 in Part 1) might be described as 'soft neurological signs' and there is a very slight possibility that these could be signs of some underlying pathology. No-one would suggest that dyslexic children with these symptoms should be routinely referred, but due attention should be given to the usual neuro-optometric tests (pupil reactions, optic discs, visual fields). In particular, troublesome headaches with no optometric cause will require medical investigation. The maxim 'first or worst' is useful for identifying headaches likely to require early medical attention; the first refers to the first ever headache or the first headache of a new type.

▶ Box 1

MEM RETINOSCOPY

The accommodative lag can be measured by retinoscopy using the monocular estimate method (MEM). The subject binocularly fixates a detailed target on the retinoscope and is asked to keep this clear. Retinoscopy is carried out along the horizontal meridian and lenses are very briefly held in front of each eye to neutralise the retinoscope reflex. Each lens should only be present for a split second so as not to disrupt the status of the patient's accommodative and binocular response. The accommodative lag is usually about +0.50D to +0.75D; values greater than this may indicate accommodative insufficiency. If a negative lens is required to neutralise the reflex, this suggests that accommodative spasm is occurring. This test may give useful additional information when there is a low amplitude of accommodation, and with unco-operative patients.

Visual fields

It has been suggested in the literature that visual fields might be abnormal in dyslexia. For the reasons given earlier, it is certainly worth checking visual fields and nearly all children from the age of seven years can cope with supra-threshold testing. For younger or inattentive children, the threshold can be set quite low so that the test can be completed before the child loses concentration. I estimate that I have tested over 2,000 children with the 25° supra-threshold screening programme of a Henson Pro in the last few years, and only one case that I can recall had a field defect. It has been claimed that tests of kinetic perimetry reveal visual field defects more commonly in children with specific learning difficulties, but the evidence for this is weak and it is possible that attentional factors might have a differential effect on visual fields measured by kinetic perimetry¹.

Convergence insufficiency

There is controversy over whether convergence insufficiency (CI) is a correlate of dyslexia. Regardless of whether CI is especially common in dyslexia, it is undoubtedly very prevalent in the general population. Therefore, it is inevitable that eyecare practitioners will find CI from time to time in children with dyslexia. CI is not likely to be a cause of dyslexia, but if it is producing symptoms then it should be treated in the usual way².

There have been other theories and claims with various optometric factors being implicated as correlates or causes of dyslexia. These include astigmatism, aniseikonia, and hyperphoria. There is no strong evidence to suggest that these anomalies are particularly prevalent in dyslexia¹.

Additional comments

The term ‘ocular motor’ can be a source of confusion. Ocular motor refers to all types of movements of the eyes (e.g. saccadic, pursuit, and vergence eye movements) and could, arguably, also be used to describe the movement of the ciliary muscle in accommodation. Oculomotor refers to the third cranial nerve. Confusingly, in the USA the term ‘oculomotor’ is sometimes used to refer just to saccadic eye movements.

Magnocellular (magno) deficit and dyslexia

Visual processing, under normal daytime lighting conditions, occurs in two parallel

visual pathways – the magno (transient) and parvo (sustained) pathways. The main features of these pathways are summarised in **Table 1**. Research suggests that about two thirds of people with dyslexia have a deficit of the magno system¹.

Research has demonstrated that dyslexic children with the magno deficit tend to be those who manifest binocular instability. It is likely that the magno system is paramount in the feedback loop which controls binocular vision – in which case the magno deficit might be the cause of the binocular instability in dyslexia¹.

However, there are no proven treatments for the magno deficit in dyslexia and it is therefore doubtful that routine testing for this is desirable. So the main significance of the magno deficit at the moment is that it may help to tie together the different visual factors in dyslexia.

Vision scientists have expressed reservations about some of the claims which have been made concerning the magno deficit in dyslexia. Firstly, the magno and parvo pathways are sometimes assumed to be distinctly separate but this is not the case. There are many connections between these pathways and considerable overlap in their functions. So it is arguable whether any task could be a ‘pure’ measure of magno or parvo function, but rather certain stimuli can be designed to be predominantly mediated by one of the pathways. Secondly, the magno deficit is not always present in dyslexia and, even when it is, the anomaly is a subtle deficit, and can only be detected with fairly sensitive tests under certain lighting conditions. It is also sometimes assumed that the magno deficit must be a cause of dyslexia, but a correlate is not necessarily a cause. Other conditions have non-causal correlates, and it is quite possible that a magno deficit is a non-causal correlate of dyslexia.

Finally, it is sometimes assumed that the magno deficit must explain why coloured filters help some people with reading difficulties. It is highly unlikely that there is a direct causal link between the magno deficit and the benefit from coloured filters (see **Part 3**).

The Dunlop test

There have been many different theories over the years about ocular dominance and dyslexia. It was once widely argued that crossed dominance (dominant eye on opposite side to dominant hand) is a major factor in dyslexia. But the evidence for this

Table 1

Magno system is predominantly:	Parvo system is predominantly:
Rapid	Slow
Low acuity	High acuity
Low contrast	High contrast
Colour insensitive	Colour sensitive

CPD online

If you are GOC registered, you can now answer the questions on-line at www.otcpd.co.uk. Enter your GOC number and surname to log onto the system.



Select 01- or 02- for optometrist
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Select the examination you want to enter from those available. It is important that you choose the right one and do not enter your answers into any other available examinations running at the same time as you will not be able to go back to try again. Any errors made by participants cannot be recalled.



Enter your answers, and an optional email address if you want email notification of your results. Check your name is correct and press the ‘send answers’ button. The next screen will show your percentage and any credits gained.

The results page should be printed out or emailed to you if you entered your email address earlier. You will need to keep this for your records and future self-certification.

Note: Netscape Navigator 5 and Internet Explorer 5 or more recent is recommended.

is weak and it is unlikely to be helpful to measure the sighting eye or dominant hand in dyslexia.

About 20 years ago, interest in ocular dominance and dyslexia was re-awakened. However, the ocular dominance under investigation was different to sighting dominance and was a form of motor ocular dominance. A person might have a different dominant eye for sighting, motor, and sensory tasks. The particular form of motor ocular dominance which became popular to investigate in the 1980s was assessed with the Dunlop test.

The Dunlop test is a synoptophore-based test (although a version can be done with the Mallett fixation disparity unit) which is repeated 10 times for detecting the stability of the motor ocular dominant eye (reference eye). An individual has an unstable reference eye if it is, for example, found to be right eye five times out of 10 and the left eye five times out of 10. It was claimed that an unstable reference eye was a cause of dyslexia and could be treated with patching. It was initially claimed that the Dunlop test detected visual dyslexia, although this term is used by others to mean quite different things (see Part 1). In the 1980s, it became quite common for optometrists to be asked about the Dunlop test, but this is now quite rare.

The use of the Dunlop test is controversial, probably because it is unreliable¹. It seems likely that the Dunlop test, in some studies, has been detecting a form of binocular instability. If this is the case, then it might be more reliable to diagnose this with conventional methods (e.g. Mallett unit and fusional reserves) and the preferred treatment might be orthoptic exercises rather than patching.

Behavioural optometry

Another controversial approach is behavioural optometry, and the British Association of Behavioural Optometrists website lists 41 accredited behavioural optometrists in the UK. Some of behavioural optometry is profoundly sensible, for example, dealing with patients in a holistic way. Many behavioural optometrists also carry out a detailed orthoptic investigation, as recommended in this article. Others assess and treat saccadic eye movements in dyslexic people, although the literature suggests that saccadic dysfunction is not a strong correlate of dyslexia. Some behavioural optometrists give perceptual motor and gross co-ordination exercises to many dyslexic children. Some also prescribe low plus 'learning lenses' to very many children.

An American review⁹ and a recent UK review¹⁰ have noted the lack of good evidence from proper randomised placebo controlled trials. The American review concluded that: "The results of the preponderance of controlled studies in the research literature have been negative or inconclusive". The UK review noted that:

"In the behavioural optometry literature, I have found no randomised controlled trials" and concluded – "It seems to me unlikely that present behavioural optometry can satisfy evidence-based scrutiny, indeed there must be concern that groups of optometrists following idiosyncratic management strategies within areas traditionally associated with other professions might hinder the credibility and development of optometry as a whole".

It must be acknowledged that behavioural optometrists are convinced of the efficacy of their methods and are committed practitioners who are highly dedicated to the welfare of their patients. But, the history of the healthcare sciences reveals many treatment approaches which have inspired great confidence in practitioners and patients, but have been later shown by evidence-based research to be no more effective than a placebo. In this respect, the jury on behavioural optometry is still out.

Version eye movements, tracking and the DDAT system

People with dyslexia sometimes come to an optometrist because problems are suspected with their tracking. But the term 'tracking' is used variously to refer to vergence, slow pursuit, and saccadic eye movements, which are the three main types of eye movements. Therefore, the term is so vague as to be virtually meaningless. One thing which all three types of eye movements have in common is that they are all influenced by ADD (attention deficit disorder), and this may account for many reports of abnormal eye movements in dyslexia. ADD is characterised by impulsivity, motor impersistence, inattention and, sometimes, hyperactivity.

The effect of the motor impersistence and inattention can be illustrated by imagining the fairground game of threading a wire loop through a bent metal wire. If the loop touches the wire then a buzzer goes off. A child with motor impersistence and/or inattention would be most likely to be poor at this task. For example, when their attention wandered, the loop would touch the wire. In a similar way, when an optometrist carries out an ocular motility test on a child with ADD, it is quite likely that the smooth pursuit of the motility target will be interrupted by saccadic eye movements as the child's attention wanders. The same might happen during a near point of convergence test or if the child is asked to make saccades between two targets. This observation does not mean that the child has an eye movement or vergence deficit, but could just reflect the effect of momentary lapses of attention.

Saccades are the fundamental eye movement patterns for reading, and for most other activities that we do. So it seems unlikely that saccadic dysfunction would be a cause of specific reading

difficulties. If a person really had a dysfunction of their saccadic eye movement system then they would be likely to have a more global deficit instead of a specific difficulty with reading.

So, is there any experimental evidence suggesting abnormal saccades in dyslexia? Certainly, when dyslexic people read text their pattern of saccadic eye movements is unusual. For example, they make more fixations and may make more regressions to return to an earlier section which they have already read. But this is very likely to be an effect, rather than a cause, of the reading problem. In other words, because they have problems with reading, they tend to have to search harder on the page to obtain the meaning of the passage.

A few studies have measured saccadic eye movements in dyslexia during simple, non-reading tasks. Typically, the person looks at LED lights which illuminate in sequence whilst the eye movements are monitored. The results of these experiments are equivocal, but the consensus view from most research studies seems to be that abnormal saccadic eye movements are not a key underlying factor in dyslexia¹. The few studies which disagree with this viewpoint may be confounded by the effect of attention, and it will be important for future studies to fully control for the effect of ADD.

Some tests (e.g. the Developmental Eye Movement test; DEM) claim to assess saccadic eye movements without actually recording the position of the eyes. For example, in the DEM test the person 'reads' digits which have been randomly spaced in a horizontal orientation (like text). The performance at this task is compared with the more simple task of reading vertical columns of digits. The ratio of performance at these two tasks is sometimes said to be a test of saccades, although, of course, both tasks require saccades. Indeed, these tests are likely to be confounded by a great many things apart from saccadic eye movements (e.g. naming skills, decoding, language, etc). Amazingly, no peer-reviewed research studies have monitored the eye movements of people whilst they actually do the DEM test. In other words, it remains complete speculation as to whether the test actually measures any eye movement parameters.

Various tracking aids have been recommended for dyslexia, including typoscopes, the Dex frame, and most recently the COIL Visual Tracking Magnifier (VTM). Only one of these, the Dex frame, has been properly investigated in published research but was shown to be not very helpful.

Since saccadic eye movement dysfunction does not appear to be a strong correlate of dyslexia, it seems unlikely that treatments based on training saccadic eye movements will be a valid widespread treatment for people with dyslexia. One recent, exercise-based treatment for

dyslexia, the DDAT system, is based on a hypothesised cerebellar-vestibular deficit in dyslexia and claims to improve eye movements. Although this approach has received a great deal of publicity recently, a detailed critique shows that it lacks valid supporting research¹¹.

Ethical statement and acknowledgment

The author does not have a financial interest in any of the investigative tools or diagnostic instruments described in this article. The author developed the IFS exercises (Figure 3) and receives a small remuneration based on sales of these. An earlier, shorter, version of this manuscript was published by Optometric Educators as a distance learning article.

* www.eyezone.co.uk/vtequip.htm

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MQCs

Module 1 Part 2 of the Dyslexia and vision series

The role of the optometrist in dyslexia

Part 2 Optometric correlates of dyslexia

Please note there is only ONE correct answer

- What are the best two tests for detecting clinically significant binocular instability?
 - Cover test and stereo-acuity
 - Cover test and fusional reserves
 - Stereo-acuity and fusional reserves
 - Fusional reserves and Mallett unit OXO test
- Which one of the following statements is most important? When carrying out the Mallett OXO test:
 - the patient should be asked if the lines are perfectly aligned and if one or both ever move
 - the patient should be asked if the lines are perfectly aligned and if they appear flat on the page
 - the patient should be asked if the lines are perfectly aligned and if they are the same size
 - the patient should be asked if the lines are perfectly aligned and if they appear the same colour
- Which one of the following statements is most accurate? The amplitude of accommodation:
 - is always low in dyslexia
 - is more likely to be low in a poor than in a good reader
 - if poor, should be treated by prescribing negative lenses in spectacles to stimulate accommodation
 - can be treated by training convergent fusional reserves with free-space stereograms
- Which one of the following statements is true? MEM retinoscopy:
 - stands for minimum eye retinoscopy
 - diagnoses dyslexia
 - is carried out whilst the patient fixes with both eyes
 - is carried out whilst the patient wears the subjective refractive findings
- Which one of the following statements is true? Binocular instability is:
 - more common in poor than in good readers
 - a major cause of dyslexia
 - cured by prescribing tinted lenses
 - an exophoria at near combined with an esophoria at distance

- Which one of the following statements is NOT true?
 - There are 41 accredited behavioural optometrists listed in the UK
 - Some behavioural optometrists prescribe low plus lenses to many children
 - Some behavioural optometrists prescribe eye exercises to train saccadic eye movements to many children
 - A thorough review in 2000 criticised behavioural optometry because there were only a few double-masked randomised controlled trials
- On the Mallett OXO test, what is the lowest magnitude of aligning prism that is likely to be associated with symptoms in pre-presbyopes?
 - 0.5Δ
 - 1Δ
 - 2Δ
 - 3Δ
- Which one of the following is a strong correlate of dyslexia?
 - Astigmatism
 - Visual field anomalies
 - Convergence insufficiency
 - None of the above
- Which one of the following statements is NOT true?
 - The term oculomotor refers to the third cranial nerve
 - The term ocular motor refers to all movements of the eyes
 - The term oculomotor refers to vergence but not saccadic eye movements
 - The oculomotor nerve is involved in accommodation

An answer return form is included in this issue. It should be completed and returned to: CPD initiatives (c4767b), OT, Victoria House, 178-180 Fleet Road, Fleet, Hampshire, GU51 4DA by March 24, 2004.

Under no circumstances will forms received after this date be marked – the answers to the module will have appeared in our March 26 issue and scores sent electronically to the accrediting bodies.

Questions 10 - 12 overleaf

MCQs

Module 1 Part 2 of the Dyslexia and vision series (continued)

10. Which one of the following statements is true about the magnocellular system?

- Its functions show no overlap with the parvocellular system
- It is predominantly sensitive to fine detail
- It is slower than the parvocellular system
- It is more sensitive to low contrast targets than the parvocellular system

11. Which one of the following statements is true about the Dunlop test?

- It is a test of motor ocular dominance
- It is popular because of its reliability
- It is a test of sighting ocular dominance
- It is carried out with a Maddox wing test

More than half our entries are now entered online at www.otcpd.co.uk

12. Which one of the following statements is true about saccadic eye movements?

- They are unique to reading
- They are used for most activities
- They can only be made from right to left in dyslexia, hence the reading eye movements are abnormal
- They need training in dyslexia so that the necessary eye movements for reading can be learned

The role of the optometrist in dyslexia Part 1 Specific learning difficulties

Here are the correct answers to Module 1, Part 1 which appeared in our January 30, 2004 issue.

1. Which of the following statements is most accurate? A phonological decoding deficit is:

- a cause of unstable eye movements
- a core cause of dyslexia
- detected as a low amplitude of accommodation
- treated with coloured lenses

b is correct

There is overwhelming evidence to suggest that a core deficit, in most cases of dyslexia affecting English speaking people, is a difficulty with phonological decoding. This refers to the ability to translate a visual image into its component sound units.

2. Which of the following statements is most accurate? Optometrists:

- treat dyslexia
- cure visual dyslexia
- diagnose dyslexia
- treat visual problems in dyslexic people

d is correct

If an optometrist finds a visual deficit then they should not claim to be able to cure the dyslexia, since any visual treatment will not be likely to influence phonological skills. Visual factors are rarely the sole cause of reading difficulties, but are often contributory factors. Optometrists do not treat dyslexia, but they can treat visual problems in dyslexic people, which may make reading easier.

3. Which of the following statements is most accurate?

- Dyslexia is a developmental problem, so only affects children
- In dyslexia, a spelling difficulty is less likely to persist than a reading difficulty
- In dyslexia, the reading difficulty is less likely to persist than the spelling difficulty
- Dyslexic people, with professional extra teaching, will not have significant difficulties in adult life

c is correct

Dyslexia is a lifelong condition. As children age, the reading problem in some cases becomes less apparent, but a spelling difficulty usually persists throughout life.

4. Which of the following statements is true? The term 'visual dyslexia' has been used to describe dyslexic people:

- with a visual-spatial deficit on psychometric testing
- with a magnocellular deficit
- with binocular instability
- all of the above

d is correct

The term 'visual dyslexia' has been used to describe many different things and is the cause of much confusion. Indeed, it is argued that this term is more likely to mislead than to inform and is best avoided.

5. Which of the following statements is NOT true?

- People with dyscalculia always have difficulties with numerical skills
- People with dyspraxia always have a disorder of voluntary movement
- People with attention deficit disorder are always hyperactive
- People with attention deficit disorder always have difficulty concentrating

c is correct

There are two forms of attention deficit disorder – the condition can occur with or without hyperactivity. But people with this condition will find it harder to concentrate than people with good attentional skills.

6. Which of the following is not a cause, in some cases, of profound learning disability?

- Dyslexia
- Severe hypoxia at birth
- Fragile X syndrome
- Cerebral palsy

a is correct

Profound learning disabilities can be caused by many factors, including hypoxia at birth, fragile X syndrome, and cerebral palsy. Dyslexia, which is a specific learning difficulty, is not a cause of profound learning disabilities.

7. Three of the options below describe ways in which attention deficit disorder (ADD) might influence findings in an optometric examination. Which option is not likely to result from ADD?

- The patient appears to daydream during eye examination
- The patient's fixation keeps wandering during ophthalmoscopy
- The patient fidgets during eye examination
- The patient is abusive and aggressive during eye examination

d is correct

Attention deficit disorder is characterised by inattention, impulsiveness, poor vigilance and motor impersistence. This may cause children's attention to wander during optometric tests and fidgeting. But attention deficit disorder is not typically associated with abusive and aggressive behaviour.



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We are also Distributors of the **City Coloured Overlay Screener**. This is a Windows® based computer program designed to identify those likely to benefit from the use of Intuitive Overlays and helps to determine the optimum colour.



Answers

8. Which one of the following phrases best describes the sight vocabulary?

- a. The vocabulary that a person can readily visualise in their 'mind's eye'
- b. The size of word that can be perceived according to the person's visual field
- c. Simple words that can be recognised without phonetic analysis
- d. Complex words that can be recognised by breaking them down into their sound components

c is correct

When children first start to read, they learn to recognise simple words by their shapes (sight analysis) – building their sight vocabulary. Later, they learn how to analyse complicated words by breaking them down into their sound components – phonetic analysis.

9. Which one of the following statements is not true about visual symptoms in dyslexia?

- a. Children who report words moving around on the page are probably hysterical
- b. Visual symptoms are more likely to be reported by children with dyslexia than by good readers
- c. Visual perceptual distortions can result from both binocular instability and Meares-Irlen syndrome
- d. Headaches might be a sign of uncorrected refractive errors, binocular vision anomalies, or Meares-Irlen syndrome

a is correct

It is not uncommon for children with dyslexia to report words moving around on the page and it is helpful to specifically ask children about this symptom. Of course, this might be a visual conversion (hysterical) reaction, but it is probably more likely to be a sign of Meares-Irlen syndrome or

binocular instability. A difficulty with interpreting visual symptoms in patients with dyslexia is that these symptoms are non-specific; a given symptom may have several different causes.

10. Which one of the following phrases best describes an evidence-based approach to healthcare?

- a. Always using the latest techniques in place of conventional approaches
- b. Trying new approaches out on a few patients free of charge and, if they seem to work, adopting them
- c. Ignoring individual clinical expertise but taking account of evidence from rigorous systematic research
- d. Integrating individual clinical expertise with the best available external clinical evidence from rigorous systematic research

d is correct

The practice of evidence-based healthcare means integrating individual clinical expertise with the best available external clinical evidence from rigorous systematic research. Both these components (individual expertise and external evidence) are important. If practitioners try a new approach out on a few patients and then decide whether to adopt it, they are really basing their clinical decisions on their own research. But this research is unlikely to be masked, controlled, or to use adequate subject numbers.

11. When are treatments considered to be most valid?

- a. When supported by case studies published in interdisciplinary peer reviewed journals
- b. When supported by controlled trials (cohort studies)
- c. When supported by systematic reviews of controlled trials (cohort studies)

- d. When supported by double-masked randomised placebo-controlled trials

d is correct

The highest level of evidence is attached to double-masked, randomised placebo-controlled trials (RCTs). The advantage of this type of research trial is that the beliefs of the practitioner and the patient cannot influence the result. A treatment is only taken as being proven when it is supported by one, or ideally more than one, RCT.

12. Which of the following statements is the most accurate?

- a. The evidence-based approach should be used to validate techniques that have been used for years
- b. The evidence-based approach should be used to validate new techniques for investigation and diagnosis
- c. The evidence-based approach should be used to validate new techniques for treatment
- d. All of the above

d is correct

The evidence-based approach is useful to investigate techniques for investigation, diagnosis and treatment. There are many examples where rigorous research has shown an old method to be better than a new one – new is not always good.

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