# Cerebral visual impairments (CVI)

# and the CVI Range assessment

## This booklet provides information for parents and carers

Version created: 24th October 2024

## Cerebral visual impairments

By reading this guide for parents, we hope you will come away understanding some of the effects a cerebral visual impairment (CVI) might have on your child, why a functional vision assessment can be important for your child, and what you might expect from a CVI Range assessment. After this brief guide about CVI and the CVI Range we include some general principles you might consider for adapting your child's home or school environment to improve visual accessibility.

A CVI is a brain based visual impairment. This means that the eye may be healthy but certain areas of the brain, or the connections between the eyes and the brain, don't work the way they should. Many different medical conditions can cause a CVI such as not enough oxygen getting to the brain, brain injury, or an infection such as meningitis. CVIs are the most common cause of childhood visual impairment in developed countries such as the United Kingdom. It's important to understand though that CVI is not a single diagnosis but an umbrella term for a spectrum of visual difficulties. Each individual will have their own unique combination of visual barriers to independence, and will need unique approaches that are relevant for them to resolve those barriers.

A person with a CVI may have additional brain based medical disorders such as cerebral palsy or epilepsy. They may have additional visual disorders related to difficulty with eye movements or with the eye itself. They may appear to have vision that varies from day to day or minute to minute, depending on their environment and whether they are tired. They may find cluttered or low contrasting environments particularly challenging. They may only focus on objects that are brightly coloured, reflective, or moving. They may struggle with one or more of their other senses, for example they may find it difficult to look and listen at the same time. Characterising the pattern of your child's visual impairments, difficulties, and behaviours will help you understand how they are affected in daily life. This will often require a team of professionals such as teachers, therapists, and doctors, and they will all need your help to understand your child's unique abilities.

Recommended techniques for the education of children with CVIs can be very different to those for children with other visual impairments. In particular, a child with a CVI often has the potential to improve their functional vision through habilitation, therapy, and natural development. Functional vision refers to the ability to use vision for daily activities such as independent mobility, communicating with friends and family, or finding items at the supermarket. It's important to understand that while improvements in functional vision can occur some visual processing difficulties are likely to remain. It can be helpful to think of strategies that might help compensate for these visual difficulties. An example of this is learning a new scanning strategy to help compensate for restricted visual fields. Compensatory strategies often require sustained attention so if a child with CVI is tired or distracted they can find it difficult to maintain the strategy, and their functional vision will appear to fluctuate.

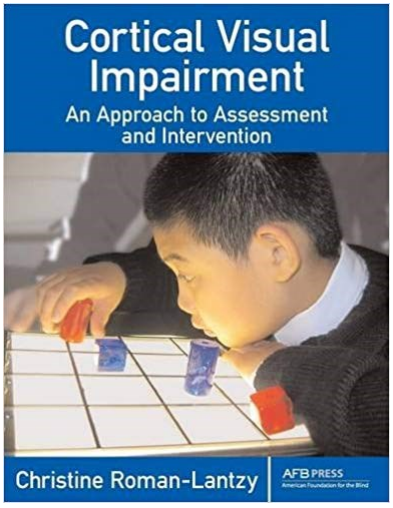
## The CVI Range* assessment

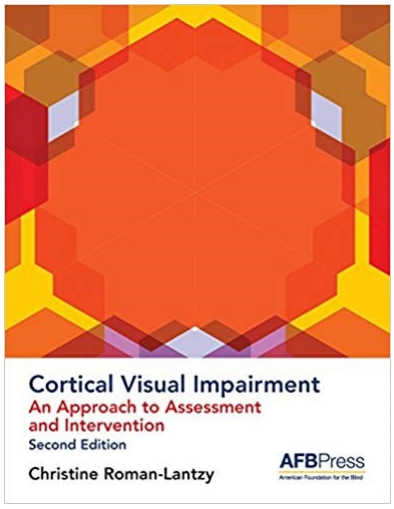
An assessment of your child's visual abilities can give invaluable information when preparing adaptations, interventions, and education. A clinical assessment with an orthoptist or ophthalmologist can highlight which visual functions are impaired (e.g. visual acuity, visual fields, contrast sensitivity, etc.). Neuropsychological assessments can highlight whether your child has a specific visual perceptual impairment (e.g. prosopagnosia: difficulty recognising faces). A functional vision assessment can highlight what your child is able to do with their vision during daily activities. The CVI Range is a functional vision assessment that has been designed specifically for children and young people with a CVI rather than other forms of visual impairment. Scientific research has demonstrated that it provides a reliable measure of the impact that CVI has on a child's functional vision.

The CVI Range assessment consists of three main components: i) interviews and a questionnaire with parent carers, ii) a structured face-to-face assessment of the child's visual abilities, and iii) an informal observation of the child behaving naturally. There are ten behavioural characteristics that are assessed during a CVI Range assessment, including but not limited to: preferences for visual complexity, colour, movement, visual field awareness, and visual novelty. The aim of the assessment is to identify the presence of any of these characteristics and evaluate their impact on daily activities on a scale from 0-10, with higher scores indicating more developed functional vision. The outcome of the assessment is a personalised description of how your child responds with respect to each CVI characteristic, and two scores that are usually combined to give a range (e.g. CVI Range = 5-6). Practical strategies can be suggested for each characteristic that hasn't been resolved to promote development of functional vision.

*Roman-Lantzy, C. (2007). Cortical Visual Impairment: An approach to Assessment and Intervention. New York: American Foundation for the Blind.

The CVI Range outcomes can also be categorised into three broad phases of visual development to indicate what environmental adaptations might be necessary to support independence. Phase 1 is the earliest phase (CVI Range 0-3) when a child may be just beginning to use their vision, phase 2 (CVI Range 3-7) indicates that a child is learning to integrate vision and function, and phase 3 (CVI Range 7-10) indicates a child is using their vision for daily activities. At phase 1, children with CVIs often have difficulty with visual complexity and only respond visually in strictly controlled environments where visual clutter and background noise is minimised (e.g. within a plain coloured tent). At phase 2, children with CVIs may still have difficulties with visual complexity and sensory distraction and consideration should be given to this in environments where attention is required for learning and other activities (e.g. uncluttered classroom environments with clearly organised storage). At phase 3, children with CVIs may be starting to learn to compensate for visual complexity themselves but should be aware that when they are tired, distracted, or ill this will become more difficult.



## Adapting your home or school environment for someone with a cerebral visual impairment

People with CVIs can face a range of difficulties in their daily life. In some cases, simple adaptations in the home or school environment can help these young people overcome barriers to independence. Adaptations should always be made with the specific needs and abilities of the individual in mind but there are some common themes that you can consider.

Too much visual information can be overwhelming for someone with a CVI so background clutter and decorations should be kept to a minimum. In some cases a plain coloured tent or curtains surrounding the individual can be used to block visual clutter. Background noise can also make processing visual information more difficult when trying to build visual behaviour so creating a quiet and calming environment is usually preferred. Household items and classroom equipment can be kept out of sight when not in use, in clearly labelled storage or behind plain curtains. Plain colour rather than patterned floor, wall, and fabric coverings can also be considered. Keep room layouts clear, minimising furniture to maximise space available for movement, and inform individuals if furniture has to be moved.

Reduced clarity of vision, reduced contrast sensitivity, and reduced visual fields are common symptoms of CVIs. This means you should carefully consider the use of lighting, contrast, and positioning in the home or school environment. Natural light has many beneficial features but is not easy to control, and it's important to have a good even illumination when attempting tasks that require functional vision. Dimmable lighting and task lighting can be used to tailor the levels of artificial light to individual needs, activities, and available natural light. One downside to lighting is glare, and high-gloss areas should be avoided. Focal light sources can be diffused with lamp shades for light fittings or vertical blinds for windows, which can help prevent involuntary light gazing behaviour.

Contrasts in colour and brightness allow us to see where one object ends and another begins. Contrast can be used to raise awareness of obstacles, landmarks, important information, or small usable objects such as switches. For example, painting skirting boards and door frames a colour that contrasts the neighbouring walls and floor will help boundaries to stand out, aiding orientation around the environment.

This is by no means an exhaustive guide, but we hope it has helped explain some of the basics of CVIs and the CVI Range assessment. There is growing support and advice for children with CVIs and their families, particularly online, but it's important to get your information from reliable sources and these should not act as a replacement for the relationship your child has with their doctor. You could also consider contacting organisations such as The CVI Society or CVI Scotland in the United Kingdom, as well as our CVI team at InFocus, for more help and information.

If you have any questions about the details contained in this guide or would like to discuss arrangements for a CVI Range assessment at InFocus you can contact.

Please understand that due to part-time working hours scheduled throughout the 38-week academic year, I am not always available to take direct phone calls.

Jonathan Waddington
InFocus Charity, Topsham Road, Countess Wear, Exeter, EX2 6HA
Telephone (to reception, not a direct line): 01392 454200
Email: jwaddington@infocus-charity.org.uk