Cortical Visual Impairment (CVI): Complete Guide for Families

Your child’s eyes look healthy. The eye doctor says everything checks out. But something is clearly different about how your child sees the world. If this sounds familiar, cortical visual impairment — CVI — may be the answer you’ve been searching for.

CVI is a brain-based vision condition: the eyes function normally, but the brain has difficulty processing what they see. It is now the number one cause of visual impairment in children in developed countries, yet it remains widely misunderstood, frequently missed, and too often untreated in its most critical window of opportunity.

Receiving a CVI diagnosis — or even suspecting one — brings a rush of emotions. Fear. Confusion. The quiet grief that comes with realizing your child’s experience of the world is different from what you imagined. Those feelings are real, and they deserve acknowledgment. This guide is written for you.

We’ve written this not as a clinical reference, but as a practical, family-centered resource. You’ll find plain-language explanations of what CVI is, how to recognize it, what the diagnostic process looks like, how to support your child at home and at school, and where to turn for help. At New England Low Vision and Blindness, we work with families navigating CVI every day, and we know that knowledge is your most powerful tool.

You are not alone in this — and there is real, meaningful hope ahead.

What Is Cortical Visual Impairment?

Cortical visual impairment is a neurological vision condition in which the brain — specifically the visual cortex and the visual processing pathways — cannot accurately interpret the information the eyes send to it. The eyes themselves are often structurally normal and fully capable of detecting light and forming images. The breakdown happens downstream, in the brain’s ability to make sense of what it receives.

This is what makes CVI so different from most other vision conditions. A child with cataracts has an eye problem. A child with CVI has a brain processing problem. The practical result can look similar from the outside — the child appears not to see well — but the cause, assessment approach, and intervention strategies are entirely different.

You may also see CVI referred to as cerebral visual impairment in some medical literature. Both terms refer to the same underlying condition: vision impairment caused by damage to or atypical development of the brain’s visual processing systems, not the eyes themselves.

What Causes CVI?

CVI results from damage to, or disruption in the development of, the brain’s visual processing centers. The most common causes include:

- Hypoxic-ischemic encephalopathy (HIE): Oxygen deprivation at or around birth — the single most common cause of CVI
- Premature birth and related brain injury: Including periventricular leukomalacia (PVL), a type of white matter damage common in preterm infants
- Traumatic brain injury (TBI): Occurring before, during, or after birth
- Stroke: In infants or young children, strokes can damage the visual cortex
- Infections: Meningitis, encephalitis, and other infections affecting the brain
- Genetic conditions: Certain chromosomal and genetic differences can affect visual brain development
- Hydrocephalus: Excess cerebrospinal fluid causing pressure on brain structures, including visual pathways

CVI does not always have a single identifiable cause. In some children, the cause remains unclear even after a thorough medical investigation. What matters most is not the cause — it's understanding the condition and responding effectively.

How Common Is CVI?

CVI has become the leading cause of pediatric visual impairment in developed countries, surpassing conditions like retinopathy of prematurity and congenital cataracts. Estimates suggest CVI affects somewhere between 10 and 15 children per 10,000 births — though many researchers and clinicians believe the true prevalence is significantly higher due to under-diagnosis.

CVI frequently occurs alongside other developmental conditions. It is particularly common in children with cerebral palsy, epilepsy, developmental delays, and other neurological differences. In children with multiple disabilities, CVI is estimated to be present in 60 to 70 percent of cases — yet it is often overlooked because other diagnoses take center stage.

Recognizing CVI: Signs and Characteristics

The 10 Characteristics of CVI (Roman-Lantzy Framework)

The gold standard framework for understanding CVI comes from Dr. Christine Roman-Lantzy, a specialist in CVI who identified ten distinct visual behaviors that characterize the condition. These characteristics are now used by Teachers of the Visually Impaired (TVIs), pediatric ophthalmologists, and early intervention specialists worldwide to assess and guide intervention for children with CVI.

Cortical Visual Impairment (CVI): Complete Guide for Families

Not every child with CVI shows all ten characteristics. Presentation varies widely based on severity of brain involvement, age, and intervention history. But recognizing these behaviors in your child is the first step toward understanding their visual experience.

- Color preference: Children with CVI are often drawn to specific colors — most commonly red or yellow — and may not visually respond to objects in other colors. Your child might consistently reach for the red cup while ignoring the blue one placed right beside it.
- Need for movement: Moving objects attract visual attention more reliably than still ones. A child may track a rolling ball while completely ignoring the same ball at rest on the floor.
- Visual latency: There is a delay between when an object is presented and when the child visually responds. This can range from a few seconds to several minutes. The brain is processing — it just takes longer than typical. This is one of the most misunderstood features of CVI, and patience is essential.
- Visual field preferences: Many children with CVI see better in their peripheral (side) vision than in their central vision. You may notice your child turning their head or using sideways glances to look at something directly in front of them.
- Difficulty with visual complexity: Busy environments — crowded rooms, patterned backgrounds, cluttered surfaces — overwhelm the brain's visual processing capacity. Vision often functions better in simple, uncluttered spaces.
- Light-gazing or light aversion: Some children are strongly attracted to light sources, staring at windows, lamps, or bright screens. Others are extremely sensitive to bright light and will turn away or shield their eyes.
- Difficulty with distance viewing: Visual function may be better at close range than at distance, or the reverse. This is different from standard near- or far-sightedness and will not be fully corrected by glasses alone.
- Absent or atypical visual reflexes: The automatic reflexes most people have — blinking when an object approaches, flinching at sudden visual input — may be absent or inconsistent in children with CVI.
- Difficulty with visual novelty: Familiar objects are more likely to be "seen" than new ones. Introducing a new toy or a new face may result in no visual response at all, even if the child can see familiar objects clearly.
- Absence of visually guided reach: Instead of looking at an object and reaching for it simultaneously, a child with CVI may look first and then reach (sequentially), or reach without looking at all — using touch and spatial memory rather than sight to guide the hand.

How CVI Is Diagnosed

Diagnosing CVI requires a team approach — no single specialist or single test provides the complete picture. A comprehensive evaluation typically involves three key players working together.

A pediatric ophthalmologist assesses visual acuity, visual fields, and eye health — ruling out or identifying co-occurring eye conditions. A pediatric neurologist reviews brain imaging (MRI or CT scan) to identify neurological involvement in the visual processing pathways. A Teacher of the Visually Impaired (TVI) with CVI training conducts a functional vision assessment using the CVI Range — the standardized tool developed by Dr. Roman-Lantzy that measures where a child falls across three phases of visual function.

The CVI Range is not an eye chart test. It involves careful observation of visual behavior in structured and naturalistic settings, measuring responses to color, movement, complexity, and novelty. The results directly guide every intervention decision.

Why early diagnosis matters: The brain is most neuroplastic — most capable of forming new visual pathways — in the early years of life. Research consistently shows that children who receive CVI-specific intervention before age five make significantly greater functional gains than those who begin later. Do not wait.

What to do if you suspect CVI: Start with your pediatrician. Use specific language: “I’ve read about cortical visual impairment and I believe my child’s behaviors may match the characteristics. I would like a referral to a pediatric ophthalmologist and a pediatric neurologist, and I’m requesting a functional vision assessment by a TVI trained in CVI.” Specificity matters — many general practitioners are not yet familiar with CVI and need guidance from informed parents.

CVI Treatment and Intervention

The Good News: CVI Can Improve

Here is the most important thing to understand about CVI: because it is brain-based, it can improve. The brain — unlike the structural components of the eye — retains neuroplasticity throughout childhood. With the right intervention, the brain can develop new visual processing pathways, and functional vision can grow meaningfully over time.

Dr. Roman-Lantzy’s framework describes three phases of CVI progression. A child in Phase I has only basic visual responses — reacting to preferred colors or bright lights but not consistently recognizing objects or faces. A child in Phase II uses vision more functionally, beginning to recognize familiar objects and people in simple environments. A child in Phase III approaches near-typical functional vision in structured conditions.

Moving from Phase I to Phase II with consistent, targeted intervention typically takes six to eighteen months. Phase II to Phase III may take several years of ongoing work. These timelines vary based on severity, age at diagnosis, and the consistency and quality of intervention.

We want to be honest: CVI improvement is not guaranteed or uniform. Some children make dramatic gains. Others progress more gradually. But the evidence strongly supports that early, consistent, CVI-specific intervention leads to better outcomes than watchful waiting. This is not a condition where waiting and seeing serves your child.

Environmental Modifications

Environmental modification is the foundation of CVI intervention — and something parents can begin immediately, before any formal therapy starts. The goal is to reduce visual noise so the brain can focus its processing capacity on what’s in front of your child.

- Reduce visual complexity: Remove clutter from play and learning spaces. Use solid-color backgrounds instead of patterned ones. Present one object at a time rather than a collection.
- Use preferred colors intentionally: Wrap favorite objects in red or yellow. Use colored tape on boundaries or steps you want your child to notice.
- Control lighting: Reduce glare and increase contrast. Consider backlighting objects — placing them in front of a light source or on a light box. Many children with CVI respond dramatically better to backlit materials than to objects in ambient room lighting.
- Position objects within the child’s best visual field: If your child consistently turns their head or uses one side, present materials within that preferred field.
- Allow time for visual latency: Present an object and wait. Don’t pull it away before the brain has had time to process. Patience here is not passivity — it is an active intervention strategy.

Therapeutic Approaches

Alongside environmental modifications, a multi-disciplinary therapeutic team provides the most effective CVI intervention:

- Teacher of the Visually Impaired (TVI) with CVI training: Provides targeted visual stimulation, conducts ongoing CVI Range assessments, and guides the family and school team. This is the cornerstone of CVI intervention.
- Occupational therapy: Focused on visual-motor integration — helping your child use vision to guide movement, reach, and daily task performance.

- Speech and language therapy: Visual processing plays a significant role in communication development. Many children with CVI benefit from speech therapy for joint attention, eye contact, and comprehension of visual-contextual cues.

- Early intervention programs (birth to age 3): Under the Individuals with Disabilities Education Act (IDEA), children from birth to age three are entitled to free early intervention services. If your child has not yet been referred, this is a priority. The intervention delivered in these years has lifelong impact.

CVI at School: Accommodations and Advocacy

When your child enters the school system, your role shifts from care coordinator to advocate. Understanding your child's educational rights — and knowing how to use them — is one of the most impactful things you can do for their long-term success.

Your child's legal rights: Under the Individuals with Disabilities Education Act (IDEA), children with CVI are entitled to a free and appropriate public education with accommodations and services tailored to their unique needs, delivered through an Individualized Education Program (IEP). Some children may also qualify for a 504 Plan, which provides accommodations without formal special education services.

Key accommodations to request in the IEP or 504 Plan:

- Reduced visual clutter on worksheets and printed materials

- Extra time for visual tasks, to account for visual latency

- Preferential seating based on the child's best visual field

- High-contrast, solid-color adapted materials

- A light box for visual materials

- CVI-informed assistive technology (tablet, large text, simplified digital interfaces)

- A Teacher of the Visually Impaired on the educational team — ideally with documented CVI training

- Regular CVI Range reassessments to update goals as vision develops

Advocacy tips: Come to IEP meetings prepared. Bring documentation of your child's CVI Range scores, functional vision assessment results, and specific examples of how CVI affects their learning. Request that the TVI on the team have documented CVI training. You have the right to request an independent educational evaluation if you disagree with the school's findings.

Supporting Your Child with CVI at Home

Cortical Visual Impairment (CVI): Complete Guide for Families

Home is where the most consistent intervention happens — and where parents have the greatest influence. You don't need to be a therapist to make a meaningful difference. Small, intentional changes to your daily environment and routines can significantly support your child's visual development.

Daily routines: Consistency in the visual environment helps children with CVI use their vision more effectively. Keep furniture in predictable positions. Store frequently used items in consistent locations. Introduce visual expectations before activities ("We're going to look at your book now — here it is, on the yellow cloth").

Play and development: Choose toys in your child's preferred colors, with high contrast and movement. A bright red ball on a dark solid-color blanket is a far better visual target than a multi-colored toy on a patterned rug. Light-up toys and backlit surfaces attract visual attention in Phase I and Phase II children. Introduce new objects one at a time and allow several exposures before the child may visually register them.

Reading and literacy: Children with CVI can learn to read — but they often need adapted materials. Look for books with minimal text per page, high-contrast images on solid backgrounds, and predictable layouts. Backlighting images on a light box significantly improves visual accessibility. Digital reading apps with customizable settings — large text, simplified backgrounds, dark mode — are powerful tools as your child progresses.

Technology at home: Tablets and iPads can be excellent visual learning tools for children with CVI when set up with intention. Use dark mode, simplified home screen layouts, and apps designed for CVI learners such as CVI Connect and Little Bear Sees. Purposeful screen time used as visual therapy is meaningfully different from passive media consumption.

Take care of yourself: Parenting a child with CVI is demanding — emotionally, logistically, and physically. Caring for yourself is not a luxury. It is a necessity that allows you to show up fully for your child. Connect with other CVI families, seek rest when you can, and accept help when it's offered.

CVI Resources and Community

You don't have to navigate CVI alone. A growing network of organizations, researchers, and families is dedicated to supporting children with CVI and the people who love them.

National and international organizations:

- Perkins School for the Blind — A leading CVI educational resource offering professional development, family guides, and an extensive CVI eLearning library
- American Foundation for the Blind (AFB) — Broad vision loss resources including research, advocacy, and family support tools

- Pediatric CVI Society — A research-focused organization with excellent family resources and international community connections
- CVI Scotland — An extensive open-access library covering CVI research, intervention approaches, and family guidance

Parent support communities: The CVI parent community on Facebook is active and knowledgeable. Search “CVI Parent Support” to find groups where families share experiences, strategies, and encouragement. Hearing from parents a few years ahead of you on this journey can be as valuable as any clinical resource.

Essential reading: *Cortical Visual Impairment: An Approach to Assessment and Intervention* by Dr. Christine Roman-Lantzy is the definitive clinical guide to CVI, and is accessible enough for informed parents. Many families find it invaluable for understanding what their child’s evaluation results actually mean in practical terms.

State early intervention programs: Every U.S. state has an early intervention program for children from birth to age three with developmental needs. Your pediatrician can refer you, or you can self-refer in most states. Services are free or low-cost and can include TVI services, occupational therapy, and speech therapy.

At New England Low Vision and Blindness, we support families with CVI across New England through evaluation, device recommendations, assistive technology training, and ongoing guidance. Learn more about our low vision services and how we work alongside families and school teams.

Frequently Asked Questions About CVI

Will my child’s CVI get better?

Many children with CVI do make meaningful improvements over time — particularly with early and consistent CVI-specific intervention. Because CVI is brain-based, the brain’s neuroplasticity means new visual processing pathways can develop. Improvement is not universal, and the degree varies considerably. Some children progress from Phase I to Phase III and function with near-typical vision in many situations. Others make more modest gains. What is consistent: intervention improves outcomes. No intervention leaves real gains on the table.

Can children with CVI learn to read?

Yes. Many children with CVI learn to read, though they often need adapted materials and instruction approaches. Literacy for children with CVI may involve larger text, high contrast, simplified page layouts, and digital tools with adjustable settings. Literacy is a realistic goal for many children with CVI, and it should be pursued with the same expectation applied to any other child.

Cortical Visual Impairment (CVI): Complete Guide for Families

Is CVI the same as being blind?

Not exactly. CVI is classified as a visual impairment, and many children with CVI do qualify as legally blind based on visual acuity measurements. But CVI is a complex, fluctuating condition — not a static absence of sight. A child with CVI may have moments of significantly better visual function than their acuity scores suggest, particularly in optimized environments. CVI exists on a spectrum, and functional vision often far exceeds what standardized acuity tests capture.

How is CVI different from other visual impairments?

The key difference is location. Most visual impairments — cataracts, glaucoma, retinal dystrophies — involve the eye itself. CVI involves the brain's ability to process what the eyes see. This means standard eye exams often return normal results for children with CVI, standard low vision aids may be less effective, and intervention focuses on the brain rather than the eye.

Does CVI affect intelligence?

CVI itself does not cause intellectual disability. However, CVI frequently co-occurs with other neurological conditions — such as cerebral palsy or chromosomal differences — that may affect cognitive development. Importantly, CVI can cause children to appear less cognitively capable than they are, because so much of how we assess intelligence relies on visual processing. Children with CVI who receive appropriate accommodations consistently demonstrate higher cognitive function than initial impressions suggest.

A 5-Step Action Plan for Newly Diagnosed Families

No top search result gives newly diagnosed families a clear roadmap. Here is ours — a practical starting point when the diagnosis is fresh and the path forward feels unclear.

- Request a CVI Range assessment from a trained TVI. This is the foundation of everything else. The CVI Range assessment tells you where your child is functioning and guides every intervention decision. Contact your school district's special education department or your state's early intervention program to request this.
- Start environmental modifications at home immediately. You don't need to wait for formal therapy to begin. Simplify visual spaces, use preferred colors, present objects on solid backgrounds, and allow extra time for visual response. These changes are low-cost and can begin today.
- Request early intervention services if your child is under three. Contact your state's early intervention program — your pediatrician can refer you, or you can self-refer. Services are free or low-cost and can include TVI, occupational therapy, and speech therapy from a CVI-informed team.

- Connect with other CVI families. Online communities, Perkins School resources, and local parent groups provide perspective, practical strategies, and emotional support from families who have been exactly where you are right now.
- Schedule a consultation with a low vision specialist. A specialist with CVI experience can help you understand evaluation results, explore assistive technology options, and connect you with the right community resources. At NELVB, we offer free initial consultations for families navigating CVI.

Take the Next Step: We're Here to Help

A CVI diagnosis can feel like the ground has shifted. But the families we work with at New England Low Vision and Blindness consistently tell us that knowledge and support transformed their experience — from overwhelming and uncertain to purposeful and hopeful.

Our team has deep experience supporting children with CVI and the families who love them. We can help you understand your child's functional vision assessment results, identify appropriate assistive technology, connect you with qualified TVIs across New England, and build a support plan that spans home, school, and therapy.

The most important thing you can do right now is act — and you've already started by educating yourself. Let us help you take the next step.

Schedule a Free Consultation with New England Low Vision and Blindness

Our low vision specialists work with children and families affected by CVI throughout New England. A free consultation includes a review of your child's current evaluations, recommendations for environmental modifications and assistive technology, and a clear roadmap for next steps. No pressure — just expert, compassionate guidance.

About This Document

This white paper was created by New England Low Vision and Blindness. Portions of the content were generated using AI technology and reviewed for accuracy. However, the information is provided "as is" and is not intended as a substitute for professional advice or a comprehensive product assessment.

About New England Low Vision and Blindness

New England Low Vision and Blindness is a leading provider of assistive technology, training, and support for people who are blind or visually impaired. We serve individuals, schools, and organizations across the Northeast with personalized solutions that empower independence and improve quality of life. To learn more or schedule a no-obligation consultation, visit NELowVision.com or call 888-211-6933. You can also email us at info@NELowVision.com.