

When Early Signs of CP are Identified

Primary care providers should refer to programs specializing in infants and toddlers. These differ from “little child” programs because infants and toddlers are at a very different stage of brain development compared to older children.

CP is associated with multiple medical and developmental problems, so when possible, referral should be made to multidisciplinary programs. These address infant development as a whole, not just the motor aspects of their conditions. These programs can often be found through NICU follow-up; sometimes developmental pediatric programs, neurologists or physical medicine specialists also have multidisciplinary clinics.

The Nationwide Children’s Early Developmental Clinic cares for children with CP until they reach 3 years of age, when they transition into a program for older children.

What Providers (and Families) Can Expect After Referral

Prompt evaluation after referral should occur, using tools that the 2017 guidelines have identified as those with the highest-level evidence (and referred to in the included diagnostic algorithm). These include the Hammersmith Infant Neurological Examination (HINE); the Prechtl Qualitative Assessment of General Movements (GMs); the Test of Infant Motor Performance (TIMP); the Developmental Assessment of Young Children (DAYC); the Alberta Infant Motor Scale (AIMS); the Neuro-Sensory Motor Development Assessment (NSMDA); and the Motor Assessment of Infants (MAI). After those evaluations, the following will often occur in specialized programs:

- Diagnosis, counseling and goal setting with parents
 - Specialized surveillance, especially of hip problems
 - Coordinated care between specialty providers and therapists, and communication with the primary care provider
- Distribution of evidence-based parent and provider education resources
 - Transition of care from early specialized to later multidisciplinary programs, such as the Comprehensive Cerebral Palsy Center at Nationwide Children’s.

Examples of Evidence-Based Interventions for Infants With CP

(available at Nationwide Children’s and clinics)

TYPE OF CP	INTERVENTION
Hemiplegia	Constraint-induced movement therapy
Bilateral types	Hip surveillance, high intensity physical therapy
Any	Early, intense, enriched, task-specific, training-based therapy Positive parenting programs Parent-Infant transaction programs for speech and language

Referrals and Consultations

Online: [NationwideChildrens.org/Neonatology](https://www.nationwidechildrens.org/Neonatology)
Phone: (614) 722-6200 or (877) 722-6220 | Fax: (614) 722-4000
Physician Direct Connect Line for 24-hour urgent physician consultations:
(614) 355-0221 or (877) 355-0221.



Early Diagnosis and Intervention Guidelines for Cerebral Palsy



A New Understanding: Why Early Recognition of Cerebral Palsy is Essential

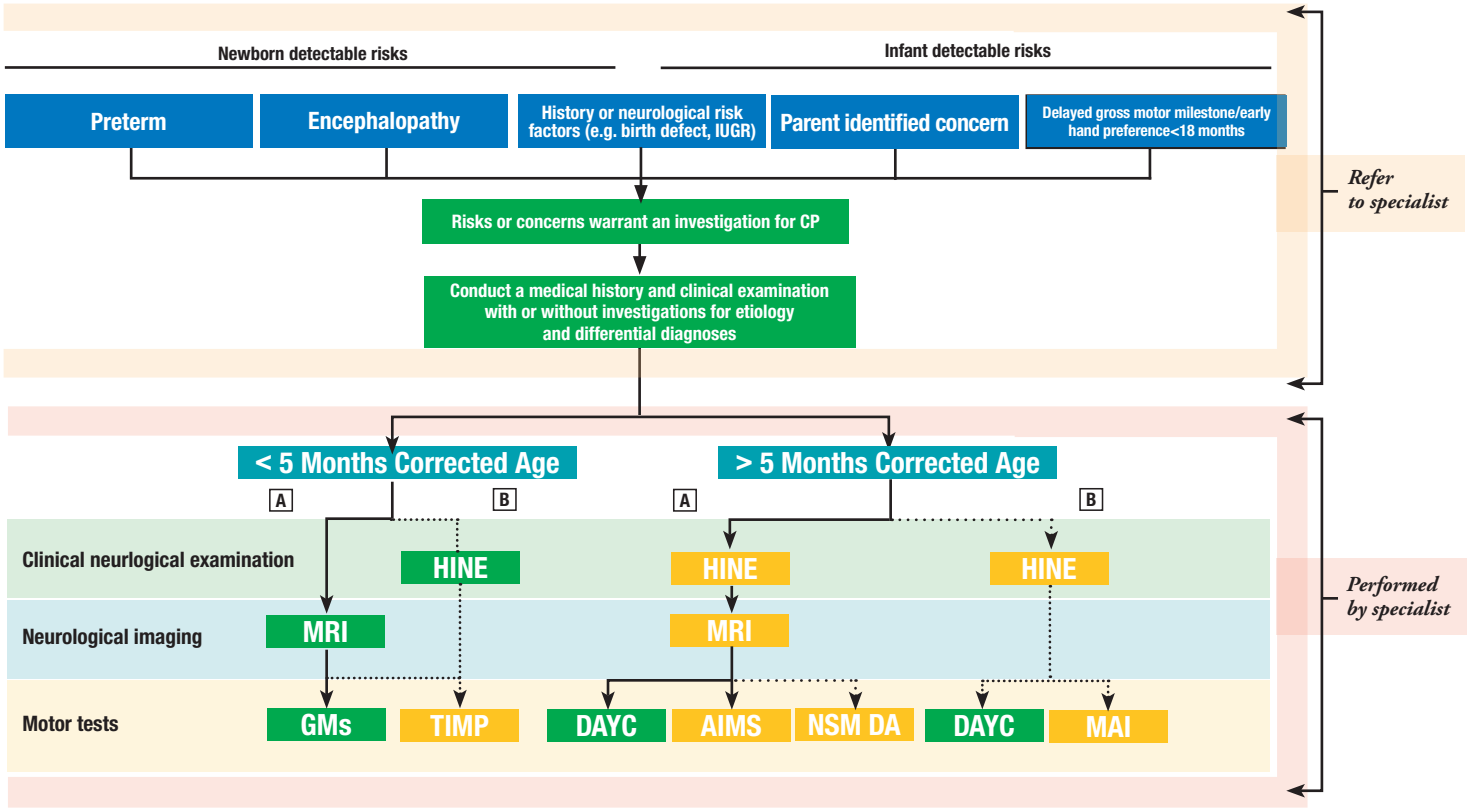
While cerebral palsy (CP) diagnoses have traditionally been made at 2 years of age or older, recent studies have shown that specialist providers can make the diagnosis as early as 6 months of age in some cases.

International guidelines for early diagnosis and intervention for cerebral palsy were published in 2017. Developed by a multidisciplinary group of scientific and clinical experts and parent stakeholders, these guidelines are based on the latest systematic review of the evidence. They state that early recognition of CP can and should occur as early as possible so that:

- The infant can receive diagnostic-specific early intervention and surveillance to optimize neuroplasticity and prevent complications
- The parents can receive psychological and financial support, if available

Specialists now have the standardized tools to diagnose early and the knowledge base to recognize which interventions will be helpful in infancy. **Pediatric practitioners, as the medical home for these children, have a critical role in the early recognition of CP.**

Algorithm for Early Diagnosis of CP/Identification of High Risk for CP



Adapted from Novak I, et al. Early, accurate diagnosis and early intervention in cerebral palsy: advances in diagnosis and treatment. JAMA Pediatrics. 2017 Sep 1; 171(9): 897-907.

KEY:

“A” is the best available evidence pathway; “B” is next best if some tools in “A” are not available

(HINE) Hammersmith Infant Neurological Examination

(GMs) Prechtl Qualitative Assessment of General Movements

(TIMP) Test of Infant Motor Performance

(DAYC) Developmental Assessment of Young Children

(AIMS) Alberta Infant Motor Scale

(NSMDA) Neuro-Sensory Motor Development Assessment

(MAI) Motor Assessment of Infants

Defining Cerebral Palsy

Cerebral palsy is a group of permanent disorders of the development of movement and posture causing activity limitation, which are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain.

In addition to problems walking, children with cerebral palsy also may have associated impairments of speech and language, feeding, bladder control, vision and hearing. They can also have complicating factors such as intellectual disability, hip displacement, epilepsy, sleep and behavioral disorders.

Cerebral palsy has a prevalence of 3.3 cases per 1,000 live births. In preterm or late preterm infants, or those with a history of birth depression, the rates of cerebral palsy are 2 to 40 times higher than in the general population. **However, almost half of children with CP do not have identifiable risk factors and are under the care of a general or pediatric practitioner.**

Recognition

The international guidelines specify two primary types of very young patients who should be evaluated for cerebral palsy. Those with “newborn detectable risks” have clear risk factors identified before, during or soon after birth – these include children with intrauterine growth restriction (IUGR), neonatal encephalopathy and/or children born preterm.

The second group has “infant detectable risks” which typically manifest after 5 months corrected age, most often in children who did not receive care in a neonatal intensive care unit. The American Academy of Pediatrics (AAP) recommends developmental surveillance at all preventive care visits and standardized developmental screening of all children at 9, 18, and 30 months. **Primary care providers, as the pediatric medical home for children, can often identify infant detectable risks with the use of evaluation tools established by the AAP and expert consensus surveys.**

Notably, these tools involve asking questions of parents to learn key elements of motor history, and focusing on six agreed-upon signs that should prompt early referral to specialists for detailed evaluation of CP.

Key Elements of Motor History

KEY ELEMENTS	EXAMPLE QUESTIONS
Delayed acquisition of skill	Is there anything your child is not doing that you think he or she should be able to do?
Involuntary movements or coordination impairments	Is there anything your child <u>is</u> doing that you are concerned about?
Regression of skill	Is there anything your child used to be able to do that he or she can no longer do?
Strength, coordination, and endurance issues	Is there anything <u>other children</u> your child's age can do that are difficult for your child?

Adapted from Noritz GH, Murphy NA. Motor delays: early identification and evaluation. Pediatrics. 2013 Nov; 132(5): e1450-1.

Signs Prompting Referral for Specialist Evaluation for CP

Persistent fisting of the hands past 4 months	Stiffness or tightness in the legs between 6 and 12 months
Persistent head lag beyond 4 months	Early handedness before 12 months
Delayed sitting without support beyond 9 months	Any asymmetry in posture or movement

Adapted from Boychuck Z, Andersen J, Bussieres A, Fehlings D, Kirton A, Oskoui M, Rodriguez C, Shevall M, Snider L, Majnemer A. Prompt referral for diagnosis of cerebral palsy: from current practices to best practices. Developmental Medicine & Child Neurology. 24 Aug 2017 [Epub ahead of print]