Cerebral Palsy Diagnosis in Community Pediatrics

Diagnosing Cerebral Palsy:
Your Questions Answered and Next Steps

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We gather here on the unceded and ancestral lands of the Musqueam, Squamish, and Tsleil-Waututh nations which have been stewarded by them since time immemorial.

Disclosure

No conflicts of interest or financial ties

Learning Objectives

1. Utilize the clinical care pathway for CP diagnosis in practice
2. Implement the necessary assessments for CP diagnosis
3. Apply assessment findings to determine CP diagnosis in children
4. Communicate a CP diagnosis with parents and caregivers
5. Describe the next steps after making a diagnosis

Criteria and definition of CP

Do findings meet criteria for diagnosis?

- ✓ A group of permanent disorders of the development of movement and posture

Sign(s) consistent with a non-progressive brain disturbance (such as but not exclusive to upper motor neuron signs etc.)

AND

- ✓ attributed to non-progressive disturbances that occurred in the developing fetal or infant brain

History or investigations consistent with early non-progressive brain disturbance

AND

- ✓ causes activity limitation

Observation or report of activity limitation due to motor impairment (including delay in or not achieving milestones)

Sunny Hill Neuromotor Physician to Physician Consult Service

- Virtual consults available with developmental pediatricians
- 15-20 min appointments available
- Download booking form online – Sunny Hill Website

Case study

You meet a 12-year-old who describes himself as clumsy and reports feeling muscle tightness often. He is an aspiring athlete who skis and hopes to compete one day in the Olympics.

Past medical history:

- Born at 28 weeks' gestation by emergency C-section
- BW: 825g
- The pregnancy was complicated by preeclampsia since 19 weeks' gestation
- Spent 6 months in the NICU
- Had grade 2 IVH
- Had chronic lung disease and surgery for hernia repair
- Brain MRI at 3mo (term CA): multifocal bilateral white matter injury.
- Repeat brain MRI at 8 years: mild bilateral PVL.
- Has been generally healthy with no hospital admissions.
- He does not take any medications, he is vaccinated UTD.

Case study

Review of systems:

- He has mild anxiety- no medical treatment
- He feeds orally with no concerns.
- Normal BMs
- His height is tracking along the 25th percentile.
- There are no concerns regarding vision or hearing.
- Sleep: he used to take melatonin in the past but now does much better and will usually fall asleep at 2100 hours and will sleep through the night.

Case study

Developmental history:

GM:

- Sitting at around 9 months of age,
- Started walking at 12 months.
- Currently he is engaging in many areas of sports, he loves biking and skiing and he competes at high level but he feels that he has difficulties with balance and
- endurance. He has difficulties with dorsiflexion when skiing.
- He is also skateboarding and plays soccer and uses his left leg to kick the ball

FM:

- Uses his left hand to write which can sometimes be challenging.
- Will throw a ball and will do most sports with the right hand.
- Uses cutlery and can do buttons and tie his shoes.

There are no concerns regarding communication or social skills.

Academic:
Attends grade 6. School is going well. He is reading at grade level and is above grade level in math. He has some challenges in writing, spelling and grammar and in written expression. He has IEP to help with time management and initiation of projects as well as written expression.

Case study

Tone:

- He describes tightness mostly in his legs but can also feel it in his back, hips and neck but not in his upper extremities.
- The tightness is mostly when he wakes up and after doing sports, mostly in his calf muscles and quadriceps bilaterally.
- His legs are a bit sore after sports.

His mother feels that he is tighter than he was a few years ago and he used to be more flexible and that he can not bend like his peers and will adapt his movements.

Social:

- Lives with his parents and 8 yo healthy brother
- No family history of neurodevelopmental disorders.

Case study

On exam:

General examination was unremarkable, there were no skin lesions. No dysmorphic features. There is no spinal or sacral stigmata. WT: 50.5 kg

- Cranial nerves, cerebellar and sensory examination were normal.
- Good range in all joints except for his ankles which could be brought to 5 degrees past neutral bilaterally.
- Normal muscle bulk.
- Mildly increased tone in his hamstrings, quadriceps and gastrocs (MAS 1+) bilaterally
- Brisk deep tendon reflexes in upper and lower extremities bilaterally, lower more than upper and right more than left with 2 beat clonus on the right ankle.
- Plantars are upgoing (positive Babinski)
- Normal strength in his upper extremities with slight weakness 4+ in hip flexors, hamstrings and dorsiflexor bilaterally.
- Left a bit stronger than the right

Case study

Summary:

An active 12-year-old boy of normal cognitive function with a history of prematurity at 28 weeks and mild PVL who is presenting with increased tone and very mild weakness in his lower extremities, as well as some limitation with ankle dorsiflexion.

Dx: ?

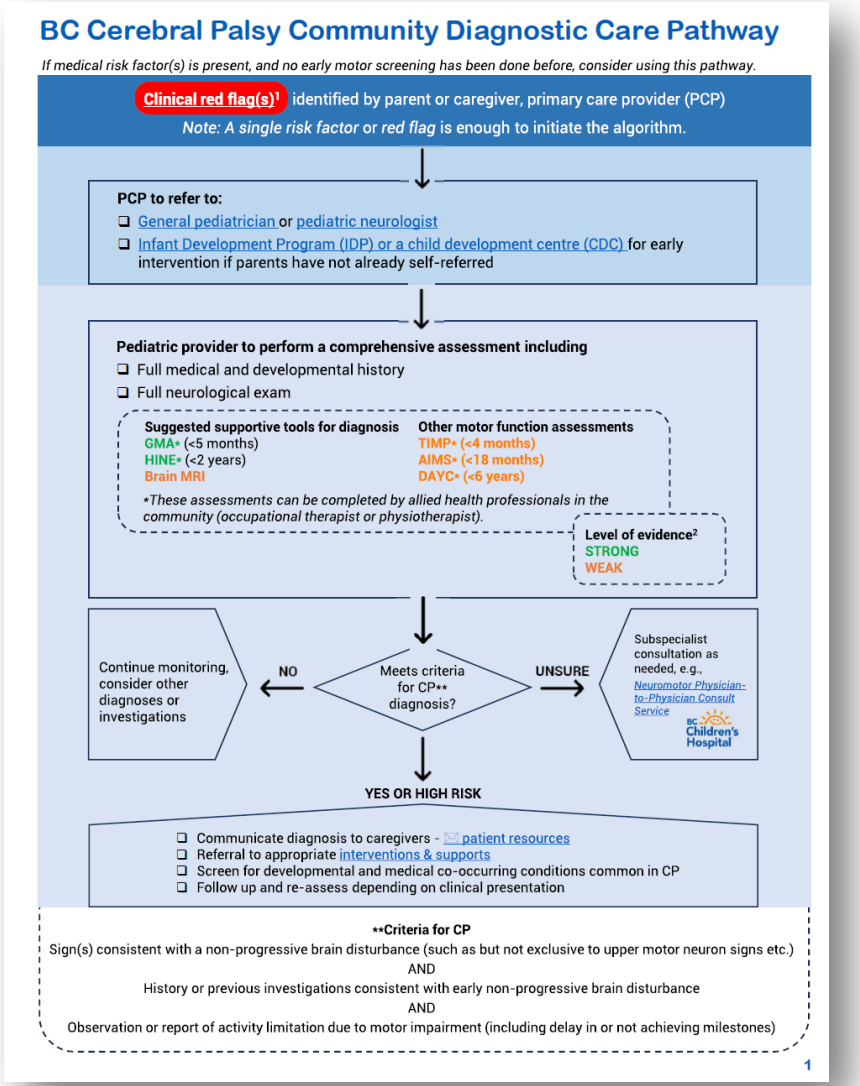
He meets the criteria for cerebral palsy, spastic diplegia, GMFCS level I, MACS level I, CFCS level I.

His clinical presentation fits the history of prematurity and the findings of PVL on his brain MRI.

What do you do next?

Referrals? Medications?

BC Cerebral Palsy Community Diagnostic Pathway



BC Cerebral Palsy Community Diagnostic Care Pathway

If medical risk factor(s) is present, and no early motor screening has been done before, consider using this pathway.

Clinical red flag(s)[1] identified by parent or caregiver, primary care provider (PCP)

Note: A single risk factor or red flag is enough to initiate the algorithm.

PCP to refer to:

- ❑ General pediatrician or pediatric neurologist
- ❑ Infant Development Program (IDP) or a child development centre (CDC) for early intervention if parents have not already self-referred

Pediatric provider to perform a comprehensive assessment including

- ❑ Full medical and developmental history
- ❑ Full neurological exam

Suggested supportive tools for diagnosis
GMA* (<5 months)
HINE* (<2 years)
Brain MRI

Other motor function assessments
TIMP* (<4 months)
AIMS* (<18 months)
DAYC* (<6 years)

**These assessments can be completed by allied health professionals in the community (occupational therapist or physiotherapist).*

Level of evidence[2]
STRONG
WEAK

Meets criteria for CP** diagnosis?

NO → Continue monitoring, consider other diagnoses or investigations

UNSURE → Subspecialist consultation as needed, e.g., *Neuromotor Physician-to-Physician Consult Service* (BC Children's Hospital)

YES OR HIGH RISK

- ❑ Communicate diagnosis to caregivers - ✉ patient resources
- ❑ Referral to appropriate interventions & supports
- ❑ Screen for developmental and medical co-occurring conditions common in CP
- ❑ Follow up and re-assess depending on clinical presentation

****Criteria for CP**

Sign(s) consistent with a non-progressive brain disturbance (such as but not exclusive to upper motor neuron signs etc.)
AND
History or previous investigations consistent with early non-progressive brain disturbance
AND
Observation or report of activity limitation due to motor impairment (including delay in or not achieving milestones)

Communicating a CP diagnosis

A mini-case: 

You've recently diagnosed a 6-month old with CP and followed up with referrals for early intervention. An email from the IDP consultant shares that mom is struggling with the diagnosis news.

What would be your next steps?

SPIKES Framework

A patient-centred approach for providing a diagnosis or difficult news

- **S** Setting up the interview
- **P** Assessing the family's perception
- **I** Obtaining the family's invitation
- **K** Giving knowledge and information to the family
- **E** Addressing the family's emotions with empathetic responses
- **S** Strategy and summary

Walter F. Baile, Robert Buckman, Renato Lenzi, Gary Glober, Estela A. Beale, Andrzej P. Kudelka, SPIKES—A Six-Step Protocol for Delivering Bad News: Application to the Patient with Cancer, The Oncologist, Volume 5, Issue 4, August 2000, Pages 302–311, https://doi.org/10.1634/theoncologist.5-4-302

SPIKES Framework – further adapted

Types of information and knowledge needed by parents of children with disabilities:

1. The diagnosis
2. Interventions
3. Daily caregiving
4. Equipment
5. Supports
6. How to explain the disability to others
7. The effects on the family
8. The future

Novak I, Morgan C, McNamara L, te Velde A. Best practice guidelines for communicating to parents the diagnosis of disability. Early Human Development. 2019;139:104841. doi: 10.1016/j.earlhumdev.2019.104841.

Further Learning and Resources

Hammersmith Infant Neurological Exam

https://hollandbloorview.ca/our-services/programs-services/neuromotor-services/hammersmith-infant-neurological-examination-hine

https://www.mackeith.co.uk/hammersmith-neurological-examinations

Pathways™

Request an account and find all the resources mentioned in one hub
https://pathwaysbc.ca/login

UBC CPD

https://ubccpd.ca/cp-resources

Acknowledgements

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