

# PCCA Hip Surveillance Schedule



## DEFINITIONS

### Hip Surveillance

- Hip Surveillance is the process of identifying and monitoring early indicators of progressive hip displacement.

### Migration Percentage (MP)

- Migration percentage (MP) measures the percent of the femoral head that is outside the bony acetabulum. MP is measured on AP pelvis x-rays and is the key radiographic measure used to quantify hip displacement.

### Hip displacement

- The lateral movement of the femoral head out from under the acetabulum

### Hip subluxation

- Hip displacement where the femoral head is partially displaced from under the acetabulum ( $mp \geq 33\%$ )

### Hip dislocation

- Hip displacement where the femoral head is completely displaced from under the acetabulum ( $MP = 100$ )

### Gross Motor Function Classification System (GMFCS)

- A widely used method for classifying the movement ability of children with cerebral palsy. It consists of five levels and describes gross motor function on the basis of self-initiated movement with particular emphasis on sitting, walking, and wheeled mobility (CanChild). Level I is least severe and indicates independent mobility and Level V is the most severe and indicates total dependence for all mobility.

## BACKGROUND

Hip displacement is common in children with cerebral palsy (CP), especially in those children who are non-ambulatory (Poutney et al 2003) and those with increased muscle tone. The overall incidence of hip displacement in children with CP has been estimated to be approximately 35%. (Hägglund G et al 2007, Soo et al 2006).

Progressive hip displacement can lead to hip dislocations, decreased joint mobility, pain, impaired function, and a decrease in the quality of life (Poutney et al 2003). Hip surveillance programs for children with CP exist in Europe, Australia, and parts of Canada and have been adopted as standard of care. Although there is no nationwide hip surveillance program in the United States, the American Academy for Cerebral Palsy and Developmental Medicine has developed screening guidelines and several major Pediatric Orthopedic Centers are using similar hip surveillance screening guidelines. Hip Surveillance Screening recommendations are based on the child's age and GMFCS function level. These programs have demonstrated improved detection of hip subluxation and appropriate early intervention with a resultant decrease in the number of painful dislocations. (Shrader et al 2019)

## Risk factors for hip displacement include:

- GMFCS III – V
- Scoliosis
- Windswept deformity
- Hip adduction – flexion contracture
- Spasticity of the hip adductor and flexor muscles

## Clinical findings which are possible indicators of hip displacement:

- Hip pain
- Clinically important leg length discrepancy
- Decrease in hip abduction range
- Deterioration of sitting or standing skills
- Increased difficulty with perineal care or hygiene

## Criteria for referral to an orthopedic surgeon:

- $MP \geq 30\%$
- $< 30^\circ$  hip abduction
- Increase in  $MP \geq 10\%$  over 1 year
- If clinical findings indicate possible hip displacement

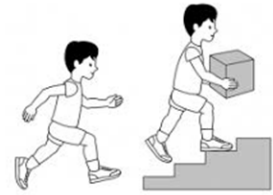
## PCCA Hip Surveillance

Many of the children at Pediatric Complex Care of Arkansas (PCCA) fall into the high risk categories on the GMFCS for hip problems. In an effort to be proactive and provide the best care for the children at PCCA, our medical team is coordinating with the Orthopedic Department at Arkansas Children's Hospital to provide a hip surveillance program.

Based on recommendations from the Care Pathways established by the American Academy of Cerebral Palsy and Developmental Medicine (AACPD), hip surveillance will be initiated for children under the age of 19 years who have been admitted to PCCA. Initial hip surveillance will consist of a determination of the child's Gross Motor Function Classification System (GMFCS) level and measurements of hip abduction range of motion done by a physical therapist at PCCA. A request for hip x-rays will be initiated at age two years or if an older child is admitted and has not had an AP pelvic x-ray. Thereafter, clinical exams and AP pelvic x-rays will occur according to the Hip Surveillance Screening Schedule. Clinical exams will consist of verifying the child's GMFCS level, measuring hip abduction, assessing pain, and checking for leg length discrepancy. Hip AP pelvic x-rays will be done in a standardized manner with pelvis in a neutral position.

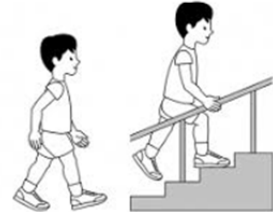
## GMFCS I

- Clinical assessment at 2 years or upon admission
- if there are risk indicators, have AP pelvis radiograph reviewed
- Review annually with clinical assessment
- Clinical assessment and AP pelvic radiograph at 5 years
- if findings are normal discharge from surveillance



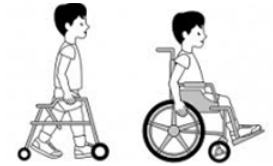
## GMFCS II

- Clinical assessment and AP pelvic radiograph at 2 years or upon admission
- Review annually with clinical assessment
- if there are risk indicators, have AP pelvis radiograph reviewed
- Clinical assessment and AP pelvic radiograph at 5 years
- if findings are normal repeat at 8 years
  - if findings are abnormal, continue annual surveillance
- Clinical assessment and AP pelvic radiograph at 8 years
- if findings are normal discharge from surveillance
  - if findings are abnormal, continue annual surveillance



## GMFCS III

- Clinical assessment and AP pelvic radiograph at 2 years or upon admission
- if the MP is abnormal or unstable, repeat every 6 months
  - once the MP is stable, repeat annually until skeletal maturity



## GMFCS IV

- Clinical assessment and AP pelvic radiograph at 2 years or upon admission
- if the MP is abnormal or unstable, repeat every 6 months until MP stabilizes
  - once the MP is stable, repeat annually until skeletal maturity



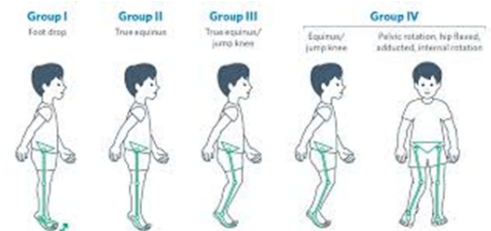
## GMFCS V

- Clinical assessment and AP pelvic radiograph at 2 years or upon admission
- if the MP is abnormal or unstable, repeat every 6 months until MP stabilizes
  - once the MP is stable, repeat annually until skeletal maturity



## HEMIPLEGIA

- Clinical assessment and AP pelvic radiograph at 2 years or upon admission
- Review annually with clinical assessment
- if there are risk indicators, have AP pelvis radiograph reviewed
- Clinical assessment and AP pelvic radiograph at 5 years
- if findings are normal repeat at 8 years
  - if findings are abnormal, continue annual surveillance
- Clinical assessment and AP pelvic radiograph at 8 years
- if findings are normal discharge from surveillance
  - if findings are abnormal, continue annual surveillance



# PCCA Hip Surveillance Schedule



## REFERENCES

Pountney T, Mandy A, Gard P: Repeatability and limits of agreement in measurement of hip migration percentage in children with bilateral cerebral palsy. *Physiotherapy* 2003;89 (5): 276-281.

Hägglund G, Lauge-Pedersen H, Wagner P: Characteristics of children with hip displacement in cerebral palsy. *BMC Musculoskelet Disord* 2007;8:101.

Soo B, Howard JJ, Boyd RN, et al: Hip displacement in cerebral palsy. *J Bone Joint Surg Am* 2006;88:121-129.

Wynter M, Gibson N, Kentish M, et al: The consensus statement on hip surveillance for children with cerebral palsy: Australian standards of care. *J Pediatr Rehabil Med* 2011;4: 183-95.

Shrader MW, Wimberly L, Thompson R: Hip surveillance in children with cerebral palsy. *J Am Acad Orthop Surg* 2019;27 (20):760-768.