CP Hip Surveillance Clinical Care Pathway

Verify GMFCS level at every visit

Assess the following on history by RN/PT/MD
1) Presence of pain
2) Decline in function (seating, standing tolerance, mobility)
3) Increase in caregiver burden (concerns with caregiving or comfort, or difficulties with dressing or diapering)

Assess the following on physical exam by PT/MD
1) Reduction in hip abduction or asymmetry
2) Positive Galeazzi sign
3) Deterioration in gait pattern

Positive history and/or physical examination
- Hip x-ray if clinically indicated

Negative history and/or physical examination

Screening

GMFCS I
No routine hip x-ray

GMFCS II
Hip x-ray at 12-24 months or at first diagnosis if older
AND Hip x-ray 12 months later

GMFCS III, IV, V
Hip x-ray at 12-24 months or at first diagnosis if older
AND Hip x-ray 12 months later

Measure change in MP
- Is MP stable?

NO
- Hip x-ray in 12 months

NO
- Hip x-ray in 6 months
AND in 12 months

YES
- Hip x-ray every 12 months until
8 years old.
If older than 8 years, then discharge
N.B. Monitor for scoliosis, pelvic obliquity, gait deterioration;
WGH IV at risk of late onset hip subluxation

Measure change in MP
- Is MP stable?

NO
- Hip x-ray at 5-6 years old. If older than 6 years, then discharge
N.B. Monitor for coliosis, pelvic obliquity, gait deterioration;
WGH IV at risk of late onset hip subluxation

YES
- Hip x-ray at 12-24 months or at first diagnosis if older
AND Hip x-ray 12 months later

Management

Refer to hypertonia clinic if there is hypertonia in hip adductors AND:
- MP > 30%
- OR Hip pain

Refer to combined hypertonia-orthopedic clinic if there is hypertonia in hip adductors AND:
- MP > 40%

Refer to orthopedic clinic if:
- MP > 40% without hypertonia in hip adductors

Consider other management options including: physiotherapy, orthoses, positioning

2. Measure hip abduction with hip in neutral and knee extended. Restriction in hip abduction is range of movement less than 30 degrees; Hip asymmetry is a difference in hip abduction range of movement of 15 degrees or more between the right and left.

3. How to examine for positive Galeazzi test: see diagram below.

4. Change in gait pattern is particularly important for children with hemiplegia who develop Winters, Gage and Hicks (WGH) IV gait who are at risk of developing late onset hip displacement regardless of GMFCS level. The gait pattern generally presents by 4-5 years of age. (http://www.udel.edu/PT/ rudolph/Rodda2001.pdf):

   - Look for increased hip adduction and internal rotation on gait examination.

5. Refer to Box A for hip x-ray requirements, calculating change in MP, and determining if MP is stable.

6. In the presence of scoliosis, pelvic obliquity, or deteriorating gait, children/youth are at increased risk of hip subluxation. Consider hip x-rays every 12 months starting in pre-puberty (8-10 years) until skeletal maturity (14-16 years).

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**Glossary:**

- **GMFCS** – Gross Motor Functional Classification System
- **MD** – medical doctor
- **MP** – migration percentage (see below)
- **PT** – physiotherapist
- **RN** – registered nurse
- **WGH IV** – Winters, Gage and Hicks type IV gait (see previous page)

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**Winter Gage and Hicks (WGH) type IV hemiplegia**

- Equinus/ jump knee
- Pelvic rotation, hip flexed, adducted, internal rotation

**Box A:**

- *Hip x-ray* refers to a single anteroposterior (AP) view of the pelvis with hips in neutral abduction.

- Change in MP = MP_{current} - MP_{last previous}

  MP is stable if the change in MP is less than 10%

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**How to calculate the Migration Percentage**

\[ MP = \frac{A}{B} \times 100 \]

- **H** = Hilgenreiner's line (a horizontal line joining the tri-radiate cartilages)
- **P** = Perkins line (perpendicular to Hilgenreiner's line drawn at the lateral margin of the bony acetabulum)
- **AI** = Acetabular index (the slope of the acetabulum; angle is measured between Hilgenreiner's line 'H' and the bony roof of the acetabulum)

**Migration Percentage (MP)** is the proportion of ossified femoral head lateral to Perkin's line 'P' = \( \frac{A}{B} \times 100 \)