Worcestershire Acute Hospitals NHS Trust

Limping Child (PIP)

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The following guidance is taken from the Partners In Paediatrics (PIP)

LIMPING CHILD

DEFINITION

- Abnormal gait usually caused by:
  - pain
  - weakness
  - deformity
- Typically due to shortened 'stance phase' in gait cycle
- Parents/carers may use the term 'limping' to describe any abnormality of gait

RECOGNITION AND ASSESSMENT

History

- Trauma
- Weight loss
- Tiredness
- Birth history including presentation at delivery and hip screening
- Development disorders, e.g. cerebral palsy
- Fever
- Recent viral infection
- Joint swelling
- Joint stiffness (particularly early morning if considering inflammatory causes)
- Sickle cell status
- Duration of symptoms
- if delay in presentation consider non-accidental injury (see **Child protection** guideline)

Examination

- Observations including:
  - temperature
  - weight
- Look for:
  - rashes
  - pallor
  - lymphadenopathy
  - hepatosplenomegaly
- Torsion can present as limp – examine testes

pGALS screening

- Gait – is it antalgic/Trendelenberg?
- Toe and heel walking
- Arms
  - look for:
    - restricted range of motion
    - stiffness
    - swelling
    - erythema
- Legs
  - look for:
    - bruising
    - deformity
    - erythema
    - is the pelvis level and leg lengths equal?
  - feel for:
    - knee effusion and warmth
    - passive and active knee flexion with internal and external rotation of hip – compare internal rotation of both hips, restricted internal rotation is a sensitive sign of hip pathology

- Spine
  - observe from side and behind
  - ask child to touch toes and observe curve
- If joint abnormality found on screening examination: more detailed **LOOK, FEEL, MOVE** approach may be needed
- Interaction between child and parents
  - in non-accidental injury mechanism may not fit injury found (see **Child protection** guideline)

DIFFERENTIAL DIAGNOSIS

Always consider septic arthritis, malignancy and non-accidental injury as possible causes of a limp in childhood

Primary differentials of atraumatic limp by age

0–3 yr	• Septic arthritis/osteomyelitis • Developmental hip dysplasia • Fracture/soft tissue injury (toddler's fractures/non-accidental injury)
3–10 yr	• Transient synovitis/irritable hip • Septic arthritis/osteomyelitis • Perthes' disease • Fracture/soft tissue injury (stress fracture)
10–15 yr	• Slipped upper femoral epiphysis (SUFE) • Septic arthritis/osteomyelitis • Perthes' disease • Fracture/soft tissue injury (stress fracture)
Other important differential diagnoses	• **In all age groups consider non-accidental injury** • Neoplastic disease, e.g. acute lymphoblastic leukaemia • Haematological disease, e.g. sickle cell anaemia • Infective disease, e.g. pyomyositis or discitis • Metabolic disease, e.g. rickets • Neuromuscular disease, e.g. cerebral palsy or muscular dystrophy • Primary anatomical abnormality, e.g. limb length inequality • Rheumatological disease, e.g. juvenile idiopathic arthritis (see **Arthritis** guideline)

Transient synovitis

- Commonest atraumatic cause of limp – usually occurring in children aged 3–8 yr
- Male predominance
- Diagnose with caution in aged <3 yr due to increased risk of non-accidental injury/septic arthritis
- Recent history of URTI (not always)
- Child able to walk but in pain
- Otherwise well – afebrile and with normal systemic examination
- Mild reduction of internal rotation of hip
- Diagnosis of exclusion – always consider septic arthritis
- Symptoms <48 hr and following brief period of observation child systemically well, afebrile and able to weight bear: no further investigations necessary
- Follow-up in 48 hr and investigate if symptoms persist
- Aged >8 yr and risk factors for SUFE: further investigations including AP and frog lateral X-rays of pelvis

Septic arthritis

- If not treated urgently joint destruction and growth arrest may occur
- Predominantly due to haematogenous spread
  - blood cultures +ve in majority of cases
- Particularly prone joints:
  - hip
  - ankle
  - shoulder
  - elbow
- *Staph. aureus* most common cause (can be caused by group B streptococcus in neonates)
- Aged <18 months more vulnerable as physis does not prevent blood entering epiphysis

Children aged <3 yr are vulnerable to septic arthritis and non-accidental injury, with transient synovitis being a rare diagnosis
Investigate all aged <3 yr

Perthes' disease

- Idiopathic avascular necrosis of capital femoral epiphysis
- More common in boys aged 4–8 yr
- Diagnosed on plain AP pelvis X-ray showing sclerosis, fragmentation and flattening of capital femoral epiphysis – may need bone scan/MRI
- Symptoms >2 weeks
- 20% bilateral

Slipped upper femoral epiphysis

- Typically affects children aged >10 yr
- Male predominance
- Often overweight
- Associated with hypothyroidism and growth hormone deficiency
- May present with knee pain
- Hip can appear shortened and externally rotated
- Plain AP films may be normal – lateral projection required if suspected
- Urgent fixation improves outcome
- Can be bilateral
- If aged >9 yr consider slipped capital femoral epiphysis – request AP and lateral X-rays/pelvis

RED FLAGS

- Child aged <3 yr
- Unable to weight bear
- Pseudoparesis
- Fever
- Systemically unwell
- Lymphadenopathy/hepatosplenomegally
- Night pain/night sweats
- Multiple joints affected/symptoms lasting >6 weeks
- Child aged >9 yr with pain/restricted hip movement

INVESTIGATIONS

- FBC and blood film
- ESR
- CRP
- If febrile, blood cultures
- X-ray 2 views; site of pain and pelvis
- If SUFE suspected obtain AP and frog lateral views of pelvis
- If suspicion of transient synovitis or septic arthritis perform joint aspiration, microscopy and culture (these cannot usually be differentiated by ultrasound and require laboratory and clinical correlation)
- If osteomyelitis/other abnormality suspected, or no clear diagnosis with persisting symptoms, further investigations may be needed; these may include:
  - MRI pelvis (with/without contrast) with paediatric radiologist
  - bone scan
  - CT (usually as addition to MRI or in unusual situations – discuss with paediatric radiologist)
- CK, sickle screen

SEPTIC ARTHRITIS

- Fever >38.5°C
- Unable to weight bear
- ESR >40 mm in first hour
- CRP >20 mg/L
- White cell count >12 x 10^9/L

Septic arthritis can still be present in the absence of these criteria

MANAGEMENT

- If any features consistent with septic arthritis:
- severe pain
- range of movement <75% normal
- fever >38.5°C
- unable to weight bear
- ESR >40 mm in first hour
- CRP >20 mg/L
- WBC >12 x 10^9/L

or

- X-ray abnormal or suggests orthopaedic problem (e.g. Perthes' disease, SUFE)
- Refer to orthopaedics for diagnostic aspiration/washout **before** starting antibiotics (see **Osteomyelitis and septic arthritis** guideline)

DISCHARGE AND FOLLOW-UP

- If blood tests and X-ray normal, irritable hip (reactive arthritis) likely
- discharge with analgesia, information leaflet and reassurance
- advise return if fever occurs or problem becomes worse

Review after 5 days

- If worse, refer for orthopaedic opinion
- If no worse, review after a further 5 days
- If still no better, arrange joint orthopaedic/paediatric review, and consider referral for paediatric rheumatology opinion
- If normal at 5 or 10 days, discharge

Algorithm for management of limp in childhood