

Extremity Pain

Essential History

Ask about:

- Description of pain
 - Onset / precipitating event / history of trauma
 - Location / distribution of pain
 - Referred pain is common in children; eg, hip pathology may present as knee pain (eg, as in slipped capital femoral epiphysis)
 - Migrating extremity pain is less likely to occur after trauma and is more typical of systemic illness
 - Multiple joint involvement may suggest reactive arthritides or rheumatological conditions
 - Pain in a non-anatomical distribution or that does not disturb enjoyable activities may suggest a functional disorder
 - Duration
 - Character
 - Muscular pain may be described as aching or cramping
 - Bone pain is often described as deep or throbbing
 - Nerve pain may present as burning, tingling, or numbness
 - Stiffness, especially with clinical evidence of arthritis not associated with trauma, should prompt concern about a rheumatological process
 - Septic arthritis will present with severe sharp pain, with associated active and passive restriction
 - Associated factors that relieve or worsen the pain
 - Pain that is worse with sleep or rest and improves with activity may suggest a rheumatological process
 - Radiation / pattern of pain
- Medical history / review of systems
 - Symptoms of spinal disease
 - Growth patterns / growth spurt
 - Recent infections, including pharyngitis or upper respiratory tract infection
 - Consider transient synovitis of the hip in children < 10 years
 - A history of exposure to viral illness might explain myalgia or arthralgia
 - Recent travel or potential infectious exposures (eg, tuberculosis)
 - History of autoimmune disease
 - Recent medications or immunisations

- Family history
 - Autoimmune disease
 - Haemoglobinopathies
 - Fibromyalgia
- Social history
- Consider HEADSS assessment
 - **H**ome
 - **E**ducation
 - **A**ctivities
 - **D**rug use and abuse
 - **S**exual behaviour and sexuality
 - **S**uicidality / depression

‘Red Flag’ Symptoms and Signs

Ask about:

- Signs of systemic illness
 - Fever
 - Weight loss
 - Sweating
 - Rashes (neonatal / infants and older children)
 - Gastrointestinal symptoms (see Diarrhoea)
 - Appetite loss
 - Lethargy
 - Anaemia
- Signs of spinal disease
 - Back pain
 - Retention or incontinence of urine or stool
 - Nerve root symptoms
- Joint swelling (eg, signs of septic arthritis)
 - Joint swelling / redness
 - Severe painful joint
 - Restriction of active / passive movement of joint
- Bone pain
- Night waking/ disturbed sleep
- Eye changes
 - Erythema (see Red eye / Pink eye)
 - Photophobia
 - Pain
- Muscle weakness

Look for:

- Fever (see Fever in under 5s: assessment and initial management [[NICE clinical guideline 160, section 1.2, Table 1](#)])
- Tachycardia
- Swelling
- Tenderness
- Deformity
- Rashes (see Petechiae and Purpura , Rashes (neonatal / infants and older children))
- Skin changes
 - Erythema
 - Bruising (see Petechiae and Purpura, Recognition of Physical Abuse (bruises))
 - Pallor
- Impaired vascular status of limb
 - Palpate pulses and check capillary refill time
- Organomegaly (see hepatomegaly / splenomegaly)
- Posture and gait abnormalities
- Signs of abuse
 - See Child maltreatment: when to suspect maltreatment in under 18s [[NICE clinical guideline 89](#)]

Differential Diagnosis / Conditions

- Orthopaedic
 - Trauma
 - Fracture
 - Physical abuse
 - Sprain
 - Overuse injury
 - Patellofemoral syndrome
 - Shin splints
 - Stress fractures
 - Osteochondroses
 - Osgood–Schlatter disease
 - Nerve and / or vascular compression syndromes
 - Carpal tunnel syndrome
 - Compartment syndrome
 - Radial head subluxation ('pulled elbow')
 - A common injury in toddlers, following sudden, forceful traction of the hand or forearm

- Often, the child refuses to use the extremity; if verbal, he or she usually localises the pain to the elbow or occasionally to the wrist
- Holds the arm with the elbow flexed, the forearm close to the chest, and the hand in pronation
- Slipped capital femoral epiphysis
- Growing pains
- Infectious / post-infectious
 - Septic arthritis
 - Osteomyelitis
 - Cellulitis / abscess
 - Transient synovitis
 - Discitis, spinal epidural abscess
 - Pyogenic or viral myositis
 - Immunisation reaction (especially rubella (see PHE Green Book Chapter 28))
 - Arthralgia or myalgia associated with streptococcal or viral infection
 - See Fever in under 5s: assessment and initial management [[NICE clinical guideline CG160](#)]
- Rheumatological / immune mediated
 - Juvenile idiopathic arthritis
 - Henoch–Schönlein purpura
 - Familial Mediterranean fever
 - Hypermobility syndrome / mixed connective-tissue disease
 - Inflammatory bowel disease
 - Dermatomyositis
 - Polyarteritis nodosa
 - Rheumatic fever
 - Reactive arthritis
 - Scleroderma
 - Serum sickness
 - Systemic lupus erythematosus
 - Systemic juvenile idiopathic arthritis
- Genetic / nutrition
 - Sickle cell anaemia, thalassaemia
 - Vitamin deficiencies (eg, vitamin D, rickets)
 - Haemophilia
 - Hypercholesterolaemia
 - Hypervitaminosis A
 - Enzyme deficiencies
 - Carnitine palmitoyltransferase deficiency

- Fabry's disease
 - McArdle's syndrome
 - Phosphofructokinase deficiency
- Mucopolidosis
- Mucopolysaccharidosis
 - Consider with joint contractures / carpal tunnel / dysmorphism / recurrent herniae / ear, nose, and throat (ENT) infections
- Neoplasm
 - Leukaemia
 - Benign neoplasms
 - Osteoblastoma
 - Osteoid osteoma
 - Malignant neoplasms
 - Sarcoma (chondrosarcoma, Ewing's sarcoma, fibrosarcoma, osteogenic sarcoma, rhabdomyosarcoma, synovial cell sarcoma)
 - Lymphoma
 - Neuroblastoma
 - See Suspected cancer: recognition and referral [[NICE clinical guideline NG12](#)]
- Other systemic illnesses
 - Caffey's disease (infantile cortical hyperostosis)
 - Fibromyalgia
 - Guillain–Barré syndrome
 - Histiocytosis X
 - Hypercortisolism
 - Hyperparathyroidism
 - Hypothyroidism
 - Sarcoidosis
- Psychosocial
 - Behaviour disorders
 - Psychogenic pain
 - Chronic regional pain syndrome (previously known as reflex neurovascular dystrophy)
 - School phobia
 - Child maltreatment
 - See Child maltreatment: when to suspect maltreatment in under 18s [[NICE clinical guideline 89](#)]

Investigations

Consider undertaking investigations if there is suspicion of systemic or infectious process, pain persists longer than anticipated, and history and examination do not lead to a definitive diagnosis.

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team):

- Full blood count and film
- Erythrocyte sedimentation rate or plasma viscosity and / or C-reactive protein
- X-ray

To be undertaken by specialist practitioners (eg, Emergency Department / General Paediatric / Paediatric Rheumatology / Orthopaedic Team(s)):

- Above tests if not already done
- Blood cultures
- Further imaging such as magnetic resonance imaging (MRI) or ultrasound scan

Treatment Approach

To be undertaken by non-specialist practitioners (eg, GP / Emergency Department Team(s)):

- Ice
- Analgesia and anti-inflammatories
- Casting and splinting
- Growing pains
 - Treatment involves heat, massage, and analgesics.
- Shin splints
 - Rest, application of ice, and anti-inflammatory drugs
- Reduction of radial head subluxation ('pulled elbow')

To be undertaken by specialist practitioners (eg, Emergency Department / General Paediatric / Paediatric Rheumatology / Orthopaedic Team(s)):

- Further treatment depends on the cause of the extremity pain.

When to Refer

Refer to specialist practitioners (eg, Emergency Department / General Paediatric / Paediatric Rheumatology / Orthopaedic Team(s)) if:

- Extremity pain occurs in the context of likely systemic illness
- Child cannot ambulate and initial assessment does not reveal a diagnosis
- High clinical suspicion for septic arthritis or osteomyelitis

- Suspicion of childhood cancers (see Suspected cancer: recognition and referral [[NICE clinical guideline NG12](#)])
- Suspicion of child maltreatment (see Child maltreatment: when to suspect maltreatment in under 18s [[NICE clinical guideline 89](#)])

Escalate care to appropriate specialist (eg, Paediatric Rheumatology / Orthopaedic / Paediatric Oncology Team(s)) if:

- A surgical procedure or subspecialist is required for definitive treatment; eg, for:
 - Operative repair of fracture
 - Ligament tear
 - Ewing's sarcoma
- A surgical procedure or subspecialist diagnostic evaluation is required; eg, for:
 - Septic arthritis
 - Juvenile idiopathic arthritis
 - Systemic juvenile idiopathic arthritis
 - Systemic lupus erythematosus

'Safety Netting' Advice

- Advise families to seek medical advice if 'red flag' symptoms occur or if no / little improvement with treatment measures.

Patient / Carer Information

****Please note: whilst these resources have been developed to a high standard they may not be specific to children.***

- [Arthritis](#) (Web page), the NHS website
- [Septic arthritis](#) (Web page), the NHS website
- [Irritable hip](#) (Web page), the NHS website
- [Henoch–Schönlein purpura](#) (Web page), the NHS website
- [Joint hypermobility](#) (Web page), the NHS website
- [Osteomyelitis](#) (Web page), the NHS website

Resources

National Clinical Guidance

[Feverish illness in children: assessment and initial management in children younger than 5 years](#) (Web page), NICE clinical guideline CG160, National Institute for Health and Care Excellence

[Child maltreatment: when to suspect maltreatment in under 18s](#) (Web page), NICE clinical guideline CG89. National Institute for Health and Care Excellence

[Suspected cancer: recognition and referral](#) (Web page). NICE clinical guidance NG12. National Institute for Health and Care Excellence

Medical Decision Support

[Recognition of Physical Abuse](#) (Web page), RCPCH Child Protection Companion

Suggested Resources

****Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.***

[Multivitamin preparations for vitamin deficiency](#) (Web page), Medicines for Children

[Pain Management](#) (eLearning - requires log-in), RCPCH Compass

[Vitamin D Deficiency](#) (eLearning - requires log-in), RCPCH Compass

[Paediatric Musculoskeletal Matters](#) (Web page), Newcastle University and Northumbria University

[Management of Chronic Pain in Children and Young People: A National Clinical Guideline](#) (Web page) Scottish Government

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