Ashford and St. Peter's Hospitals
NHS Foundation Trust

# Swollen Joints in Children

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| Guideline History | | |
|---|---|---|
| **Date** | **Comments** | **Approved By** |
| **19th June 2024** | New Guideline | Paediatric Guidelines Group |

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# 1. Swollen Joint Guideline for Children

## e. Introduction

Children commonly present to A&E, General Practice and General Paediatrics with swollen joint/s. Important differentials include malignancy, injury (including NAI), infection (septic arthritis), and Connective Tissue Disorders (including Juvenile Idiopathic Arthritis). This guideline is designed to help clinicians evaluate and manage these children appropriately, and to help avoid late diagnosis of the important conditions above.

# f. Paediatric Swollen Joint Management

**Indications for Orthopaedic Review**

1. Raised temperature
2. Raised CRP >20, ESR >40, or WCC elevated /neutrophilia
3. Non weight-bearing in a walking child
4. Abnormality on x-ray/imaging
5. To exclude unstable joint.

**Always:**

- ABCDE Approach
- History and Examination (pGALS / pREMS)

## Single Joint

### History of Trauma?

- These will normally be managed through UTC initially
- X-ray of joint
- Consider ED/ortho opinion (see full guideline)
- Consider NAI if non-ambulatory/unclear mechanism → *senior paediatric review*

### Fevers?

- IV access + bloods (FBC, film, ESR, CRP, U&E, LFT, blood culture, ASOT, ferritin)
- *Senior paediatric review*
- If ?septic arthritis → orthopaedic review + consider IV antibiotics (as per Microguide)
- Arrange imaging (x-ray or ultrasound)
- Email Dr Demetriou/Jones if JIA/reactive arthritis suspected **asp-tr.child.joint@nhs.net**

### No Fever or Trauma

- Consider X-ray of joint
- Bloods (FBC, film, ESR, CRP, U&E, LFT, blood culture, ASOT) + lyme serology/quantiferon if hx suggestive
- If imaging and bloods normal, or suspecting NAI→ *senior paediatric review*
- Email Dr Demetriou/Jones if JIA/reactive arthritis suspected **asp-tr.child.joint@nhs.net**

## Multiple Joints

- Senior Paediatric review
- Rule out malignancy e.g. ALL and consider SOJIA/Connective Tissue Disorders
- If well and no signs of polytrauma, likely *inflammatory arthritis*
- Discuss with Dr Demetriou or Dr Jones if unclear diagnosis. Phone-call or email (when not on site)
- See **section C.v** for blood tests and OP appointments to arrange

### If inflammatory arthritis suspected

- Commence anti-inflammatories (see appendix)
- Email Dr Demetriou/Jones at **asp-tr.child.joint@nhs.net** to inform and to arrange follow-up, copy reception team
- Copy RAC (rapid access clinic) form to the email address above

**Indications for Discharge**

- No temperature
- Bloods normal
- X-rays normal
- Well child with full range of movement in the affected joint
- Discussed with/informed Dr Demetriou/Dr Jones if arthritis suspected or likely (this could be by email if they aren't on site)
- Have safety netted appropriately (see ***section C.viii***)

## C. Procedures to Be Followed

### C. i. History:

- **HPC:**
  - How many joints are affected
  - When was the joint heat/swelling/pain first noticed
  - Which joint/joints are involved and pattern of onset
  - How have things changed between then and now
  - Pain score (out of 10 or using Faces)
  - Any stiffness/morning stiffness?
- **ROS:**
  - Any associated trauma/injury
  - Any preceding illness
  - Systemic symptoms e.g. fever/rash/malaise/weight loss/GI symptoms/hair loss/ulcers
  - Limitations e.g. limping/ joint restriction, effect on school
- **PMHx/FHx/SHx:**
  - Medications/steps taken pre consultation e.g. analgesia/cold compress
  - Family history of inflammatory joint problems
  - Family or personal history of autoimmune conditions including diabetes/thyroid/bowel disease
  - Related skin changes/skin conditions e.g. Psoriasis
  - Any recent foreign travel/TB contacts or tick bites

### C.ii. Examination:

Undertake overall joint assessment i.e. PGALS + PREMS

**Full examination**: including their *back, looking for rashes, organomegaly, lymphadenopathy, pallor, and testes in boys.*

- **Expose** the affected joint and its opposite counterpart
- **Observe**:
  - swelling/size/joint position
  - skin e.g. red/broken/insect bite
  - patient-controlled movements
- **Palpate**:
  - for warmth and swelling
  - joint margins and surrounding structures as pain allows
- **Check joint movements** as pain allows: passive and active

## C. iii. Differential Diagnoses

- *Trauma*- accidental or non-accidental
- *Infection within the joint*- Septic Arthritis (see below) or adjacent osteomyelitis
- *Infection of the overlying structures*- e.g. muscles (myositis) or skin (cellulitis)
- *Inflammatory condition*- e.g. arthritis (especially if more than one joint affected- see below), reactive arthritis, irritable hip (transient synovitis), cold-related symptoms eg chillblains
- *Blood inside the joint* – Haemarthrosis
- *Malignancy*- e.g. bone tumour in bone adjacent to the joint, or leukaemia if multiple joints affected

**Septic arthritis**

- can lead to joint destruction, permanent loss of function and can even become limb or life threatening if left untreated.
- Treatment consists primarily of antibiotic therapy as directed in *Microguide*.
- Usually 2 weeks of this will be intravenous, or until clinical improvement seen, and the course completed using oral therapy.
- Therapy can be targeted directly to cultured growth from blood cultures or joint aspiration. The joint may need a wash out under general anaesthetic to reduce the risk of ongoing joint damage.

**Juvenile Idiopathic Arthritis (JIA):**

- Estimated to affect 1:1000 children in the UK, but only 1:10,000 being diagnosed each year.
- Relapsing then remitting pattern. Persistent active disease can result in joint destruction and potential reduction in function of that joint.
- Associated Uveitis is often asymptomatic. Usually associated with positive ANA.
    - Urgent outpatient ophthalmological review needed if JIA suspected, as it can result in permanent visual impairment or even blindness if it is not detected and treated.

## C.iv. Action if single joint involved

As always assess ABCDE, provide analgesia and engage with play specialists where available.

***If history of trauma: (to be seen by ED doctors)***

- X-ray the joint to exclude fracture/bony injury or pathology.
    - If no bony injury identified and soft tissue damage is minimal provide simple analgesia and support if necessary.
- Orthopaediac Opinion
    - See guideline on which traumatic fractures should be referred to ortho (in progress at time of writing)
- Consider Orthopaedic opinion:
    - If unstable joint is suspected
- If non-ambulatory or mechanism not explaining the injury, seek senior paediatric review and consider Non-Accidental Injury.

***If fever:***

- IV access – FBC and film, CRP, ESR, U&E, LFT, ASOT, ferritin, Blood culture
- Consider imaging the joint via X-ray, and organising ultrasound or MRI (osteomyelitis)
- *If septic Arthritis suspected*:
    - **Senior paediatric review and urgent Orthopaedic review**
    - Antibiotics as per the local microbiological Guideline pending cultures, immediately if child is unwell.
    - Liaise with local infectious diseases/microbiology team for discussion around length of treatment and targeting antibiotics. Consider how to treat e.g. would a PICC line be suitable.
- *If reactive arthritis* or JIA is suspected*
    - Consider SOJIA +/- MAS if patient looks unwell. This would necessitate admission and immediate specialist input (see appendix for tertiary contact details)
    - Commence anti-inflammatories (see appendix for dosing)
    - **Email** asp-tr.child.joint@nhs.net to arrange a follow-up referral
    - Send RAC (rapid access clinic) form to the email address above

***If no fever or trauma:***

- Consider X-ray for possible fracture, consider bone tumour.
- If non-ambulatory or mechanism not fully explaining the injury, seek senior paediatric review and consider NAI.
- **Bloods**- FBC and film, ESR, ASOT, CRP, U&Es, LFTs, consider Lyme serology (Borellia Burgdorfeli IgG and IgM) and Quantiferon if history suggestive.
- If bloods and imaging normal, seek senior paediatric medical review and consider discussing with the paediatric rheumatology team- Dr Demetriou/Dr Jones if on site. (Secretary 2722)
- *If reactive arthritis suspected*, or JIA*:
    - Commence anti-inflammatories
    - **Email** asp-tr.child.joint@nhs.net to arrange a follow-up referral
    - Send RAC (rapid access clinic) form to the email address above, and copy Paeds reception team asp-tr.childrensunitappointment@nhs.net

    *If following an illness and patient is deemed MFFD [***see section C. vii.***]

**C.v. Action if multiple joints involved**

1. Assess using ABCDE + appropriate analgesia
2. Senior paediatric clinical review in A&E (SpR or Consultant)
3. Discuss with Dr Demetriou/Dr Jones if on site. Email asp-tr.child.joint@nhs.net if not available.
4. Unless clear polytrauma, multiple join swelling indicates likely inflammatory arthritis if the child is well. A FBC/Film/ESR /ferritin/ CRP/ ASOT will help exclude other pathology. Consider malignancy eg ALL.
5. If the child is unwell, also consider SOJIA +/- MAS. This would necessitate admission and immediate specialist input (see appendix for tertiary contact details)

**C.vi. Indications for Orthopaedic Review:**

1 Raised temperature (if you have a coryzal child with minimal limb symptoms, consider discharge after senior medical review.)
2 Raised CRP >20 , ESR >40 or WCC elevated neutrophilia
3 Non weight bearing in a walking child (See Kocher Criteria for Septic Arthritis)
4 Abnormality on x-ray/imaging – see referral guidelines (in progress)
5 To exclude unstable joint.

**C.vii. Indications for Discharge**

1 No temperature
2 Bloods normal
3 X-rays normal (if unsure consider radiology or orthopaedic opinion)
4 Well child with full range of movement in the affected joint
5 Discussed with Dr Demetriou/Dr Jones if arthritis suspected or likely

Discharge home with advice to return if unwell, deteriorates and to take regular anti- inflammatories if no medical contraindication. If clinically indicated, review in 2-3 days' time to ensure resolution and plan further follow up/necessary referrals.

**C. viii. Safety net advice at point of discharge to include:**

Seek further medical advice/return to the Emergency Department if your child develops any of the following symptoms:

- Appears more unwell
- Develops a high temperature
- Pain increases in severity
- Your child is unable to walk at all
- More joints become swollen
- The symptoms do not improve within 2 weeks

## 2. Supporting References


1. This guideline is based on the PIER Network Guideline: Management of Swollen Joints in Children. https://www.piernetwork.org/swollen-joints-children

2. Septic Arthritis NHS page found at http://www.nhs.uk/conditions/septic-arthritis/Pages/Introduction.aspx

3. Wessex First Line Empirical Antibiotic Therapy For Specific Childhood Infections 2014 available at http://www.what0-18.nhs.uk/health-professionals/front-line-hospital-staff/empirical- antibiotics-guidelines/

4. BSR & BHPR, BOA, RCGP and BSAC guidelines for management of the hot swollen joint in adults available at http://rheumatology.oxfordjournals.org/content/45/8/1039.full

5. Juvenile Idiopathic Arthritis Website found at www.JIA.org.uk

6. Consolaro, A., Negro, A., Chiara Gallo, M., Bracciolini, G., Ferrari, C., Schiappapietra, B., Pistorio, A., Bovis, F., Ruperto, N., Martini, A., Ravelli, A. " Defining Criteria for Disease Activity States in Nonsystemic Juvenile Idiopathic Arthritis Based on a Three-Variable Juvenile Arthritis Disease Activity Score." Arthritis Care & Research, 2014. 66(11):1703–1709

7. Kocher MS, Zurakowski D, Kasser JR (1999). "Differentiating between septic arthritis and transient synovitis of the hip in children: an evidence-based clinical prediction algorithm.". Journal of Bone and Joint Surgery Am. 81 (12): 1662–70.


## 3. Supporting Trust Guidelines

- Local Limping Child Pathway
- Local NAI Policy
- Local microbiology Guidelines

**c. Other Resources available:**

1) Local Limping Child Pathway

2) Local NAI Policy

3) Local microbiology Guidelines

4) PMM Online: https://www.pmmonline.org/doctor/

## 4. Guideline Governance

### a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

### b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

### c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

### d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

### e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

### f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

## g. Equality Impact Assessment

| |
|---|
| **Background**<br><br>• Who was involved in the Equality Impact Assessment |
| Dr Anita Demetriou |
| **Methodology**<br><br>• A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age)<br>• The data sources and any other information used<br>• The consultation that was carried out (who, why and how?) |
| All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group. |
| **Key Findings**<br><br>• Describe the results of the assessment<br>• Identify if there is adverse or a potentially adverse impacts for any equalities groups |
| There is no evidence of discrimination. |
| **Conclusion**<br><br>• Provide a summary of the overall conclusions |
| There is no evidence of discrimination. |
| **Recommendations**<br><br>• State recommended changes to the proposed policy as a result of the impact assessment<br>• Where it has not been possible to amend the policy, provide the detail of any actions that have been identified<br>• Describe the plans for reviewing the assessment |
| This guideline is appropriate for use. |

## h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

**Title of the document: Swollen Joints in Children**

**Policy (document) Author: Dr Anita Demetirou**

**Executive Director: N/A**

| | | Yes/No/ Unsure/NA | Comments |
|---|---|---|---|
| **1.** | **Title** | | |
| | Is the title clear and unambiguous? | **Y** | |
| | Is it clear whether the document is a guideline, policy, protocol or standard? | **Y** | |
| **2.** | **Scope/Purpose** | | |
| | Is the target population clear and unambiguous? | **Y** | |
| | Is the purpose of the document clear? | **Y** | |
| | Are the intended outcomes described? | **Y** | |
| | Are the statements clear and unambiguous? | **Y** | |
| **3.** | **Development Process** | | |
| | Is there evidence of engagement with stakeholders and users? | **Y** | |
| | Who was engaged in a review of the document (list committees/ individuals)? | | **Authors, Dr A Jones, Mr Shalin Shaunak, Priya Rajani, Support from Tertiary Services** |
| | Has the policy template been followed (i.e. is the format correct)? | **Y** | |
| **4.** | **Evidence Base** | | |
| | Is the type of evidence to support the document identified explicitly? | **Y** | |

| | | Yes/No/ Unsure/NA | Comments |
|---|---|---|---|
| | Are local/organisational supporting documents referenced? | **Y** | |
| **5.** | **Approval** | | |
| | Does the document identify which committee/group will approve/ratify it? | **Y** | |
| | If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document? | **Y** | |
| **6.** | **Dissemination and Implementation** | | |
| | Is there an outline/plan to identify how this will be done? | **Y** | |
| | Does the plan include the necessary training/support to ensure compliance? | **Y** | |
| **7.** | **Process for Monitoring Compliance** | | |
| | Are there measurable standards or KPIs to support monitoring compliance of the document? | **Y** | |
| **8.** | **Review Date** | | |
| | Is the review date identified and is this acceptable? | **Y** | |
| **9.** | **Overall Responsibility for the Document** | | |
| | Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation? | **Y** | |
| **10.** | **Equality Impact Assessment (EIA)** | | |
| | Has a suitable EIA been completed? | Y | |

| Committee Approval (Paediatric Guidelines Group) | | | |
|---|---|---|---|
| If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner | | | |
| **Name of Chair** | | **Date** | |
| **Ratification by Management Executive (if appropriate)** | | | |
| If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner | | | |
| **Date: n/a** | | | |

## 6. Appendices

### a. Use of NSAIDS in JIA

We recommend all children with swollen joint/s use the following BNF doses of one of the NSAIDS:

1) Ibuprofen – 30-40mg/kg/day in 3 divided doses (max per dose: 800mg)

2) Naproxen – 5-7.5mg/kg/dose, twice daily (max per dose: 500mg)

Consider Omeprazole cover 10-20mg for long term use or those with underlying gastric problems.

### b. Kocher Criteria for the diagnosis of Septic Arthritis (6):

A point is given for each of the four following criteria:

- Non-weight-bearing on affected side
- Erythrocyte sedimentation rate >40
- Fever > 38.5 °C
- White blood cell count >12,000

| Score | Likelihood of septic arthritis |
|---|---|
| 1 | 3% |
| 2 | 40% |
| 3 | 93% |
| 4 | 99% |

**d. Tertiary Contact Details**

**Southampton Paediatric Rheumatology Consultant on-call Mobile: 07824124592**

For use if urgent rheumatology advice is needed, in the absence of local consultant presence (Dr Demetriou or Dr Jones).