Swollen Joints in Children

Version:	1
Approval Committee:	Wessex PIER Regional Guideline Governance Group
Date of Approval:	25/06/2018
Ratification Group (e.g. Clinical network):	Paediatric Rheumatology Network
Date of Ratification	18/04/2018
Signature of ratifying Group Chair	
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Date issued:	June 2018
Review date:	June 2021
Key words:	Swollen joint, Rheumatology
Main areas affected:	Any joint
Other stakeholders consulted e.g. other clinical networks, departments	Dr Alice Leahy : Paediatric Rheumatology Consultant Dr Caroline Edwards: Paediatric Orthopaedic Consultant Dr Faye Hawkins: Paediatric Medical Consultant Dr Jason Barling: Paediatric ED Consultant
Summary of most recent changes (if updated guideline):	
Relevant national or international Guidance e.g. NICE, SIGN, BTS, BSPED	BSR & BHPR, BOA, RCGP and BSAC guidelines for management of the hot swollen joint in adults
Consultation document completed: see Appendix A	**Yes**
Total number of pages:	7
Is this document to be published in any other format?	

Does this document replace or revise an existing document? No

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1.1 Introduction

Children commonly present to A&E, General Practice and General Paediatrics with swollen joints. Important differentials include malignancy, serious injury, infection and Juvenile Idiopathic Arthritis.

- Whilst many swollen joints will be due to trauma (inflammation in ligaments around the joints i.e. twists and sprains) which will heal over time with rest and anti-inflammatory medications, the more serious conditions need to be excluded.
- It is estimated that 1:1000 children have Juvenile Idiopathic Arthritis (JIA) in the UK, with 1:10,000 being diagnosed each year (1). The natural history of JIA is that of a relapsing then remitting pattern. Persistent active disease can result in joint destruction and potential reduction in function of that joint (2).
- Associated Uveitis is often asymptomatic and there is an urgent outpatient need for ophthalmological review if you suspect JIA in a patient as these children can suffer permanent visual impairment or even blindness if it is not detected and treated.
- Septic arthritis can lead to joint destruction, permanent loss of function and can even become limb or life threatening if left untreated (3). Treatment consists primarily of antibiotic therapy as directed in the Wessex First Line Empirical Antibiotic Therapy For Specific Childhood Infections 2014 (4) or the local departmental microbiology guide**.** Usually 2 weeks of this will be intravenous, or until clinical improvement seen, and the course completed using oral therapy (5). 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.

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%

1.2 Scope

This document is for use across the Wessex Region. It could be accessed by paediatric and A&E departments, and general practitioners via the PIER website.

1.3 Purpose

The aim of this guideline is to clarify the actions needed to identify a cause for, and thus guide management for a child who presents with one or more hot swollen joints. We aim to reduce missed diagnosis of septic arthritis, Osteomyelitis, malignancy and Juvenile Idiopathic Arthritis.

1.4 Definitions

None required for purposes of this guideline.

2 Procedures to be followed:

History:

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
Any associated trauma/injury
Any preceding illness
Systemic symptoms e.g. fever/rash/malaise/weight loss
Pain score (out of 10 or using Faces)
Medications/steps taken pre consultation e.g. analgesia/cold compress
Limitations e.g. limping/ joint restriction, effect on school
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

Examination:

Undertake overall joint assessment e.g. PGALS to document any other involved joint

Examine the child completely 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
Observe skin e.g. red/broken/insect bite
Feel for warmth and swelling
Observe patient controlled movements
Palpate joint and surrounding structures as pain allows
Check joint movements as pain allows

Differential Diagnosis:

- Trauma – accidental or non-accidental
- Infection inside the joint – Septic Arthritis or adjacent osteomyelitis
- Infection of the overlying structures e.g. muscles/skin e.g. myositis or cellulitis
- Inflammatory condition e.g. arthritis (especially if more than one joint affected), reactive synovitis, irritable hips
- Blood inside the joint – Haemarthrosis
- Malignancy e.g. bone tumour in bone adjacent to the joint, or leukaemia if multiple joints affected

Action if single joint involved:

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

Any history of trauma?

- 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.
- Orthopaedic opinion to exclude significant ligament damage requiring strapping/support or haemarthrosis or if bone injury seen
- If non-ambulatory or mechanism not explaining the injury seek senior paediatric review and consider following the Non Accidental Injury protocol.

Any fever?

- IV access – FBC and film, CRP, ESR, U&E, LFT, ASOT, Blood culture
- Consider imaging the joint via X-ray, ultrasound or MRI (osteomyelitis)
- Senior paediatric review and consider an urgent Orthopaedic review if septic arthritis suspected- ?Joint aspiration needed pre antibiotics starting
- If septic Arthritis suspected antibiotics as per the Wessex Microbiology/local microbiological Guideline pending cultures
- 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 suspected following an illness and patient allowed home – for review in 3 days to a weeks' time with anti-inflammatory medications regularly to ensure resolution/improvement ideally with the team who saw them e.g. A&E or General Paediatrics.
- If swelling persists longer than 2 weeks or you feel this is more than one joint is affected inflammatory arthritis then is likely: please discuss with the consultant on call and if agreed then in hours with the peripheral rheumatology link consultant or paediatric rheumatology team helpline number 07760 158924.

No fever or trauma?

- Consider X-ray/U/S of the joint or limbs affected for fracture (consider NAI) and bone tumour.
- Bloods for FBC and film, ESR, ASOT, CRP, U&Es, LFTs, Lyme serology (Borellia Burgdorfeli IgG and IgM).
- If bloods and imaging normal then seek senior paediatric medical review and consider discussing with the paediatric rheumatology services in hours (helpline number 07760 158924).
- If non-ambulatory or mechanism not fully explaining the injury seek senior paediatric review and consider following the Non Accidental Injury protocol.
- If reactive arthritis suspected following an illness and patient allowed home – for review in a 3 days to a weeks' time with anti-inflammatory medications regularly to ensure resolution/improvement ideally with the team who saw them e.g. A&E or General Paediatrics.
- If swelling persists longer than 2 weeks or if more than one joint is affected inflammatory arthritis is likely: please discuss with the consultant on call and if agreed then in hours with the paediatric rheumatology team helpline number 07760 158924. Arrange outpatient early ophthalmology review for Uveitis screening.

Discharge could be considered by the medical team

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 rheumatology team if arthritis suspected or likely (**Helpline number 07760 158924**) in hours or general paediatrics out of hours

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

Orthopaedic review

1 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

<u>Action if multiple joints involved:</u>

As always assess ABCDE, provide analgesia and engage with play specialists where available. Unless clearly a polytrauma assume this is likely an inflammatory arthritis. Senior paediatric medical review followed by discussion with the paediatric rheumatology team (Helpline number 07760 158924) in hours. Arrange outpatient early ophthalmology review for Uveitis screening. If it seems most highly likely to be JIA then we may advise not to do any bloods until we see the patient to save them having multiple tests. If the diagnosis is not clear then a FBC/Film/ESR and CRP +/- ASOT may help exclude other pathology.

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

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 2.4g per day)
2) Naproxen – 5-7.5mg/kg/dose, twice daily (max 1g per day)

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

Other Resources available:

1) Local Limping Child Pathway
2) Local NAI Policy
3) Local microbiology Guidelines

3 Implementation

The guideline will be available for distribution and use on the PIER website. It may be used at Regional PREP training days.

4 Process for Monitoring Effectiveness

There is potential for audit to be done looking at pick up rate for septic arthritis in children, and referral times into tertiary rheumatology services. The authors contact details will be available for further areas of development to be suggested and implemented into the guideline.

5 References

1) Juvenile Idiopathic Arthritis Website found at www.JIA.org.uk

2) 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

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

4) 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/

5) 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

6) 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.

9 Appendix A

Paediatric Regional Guideline Consultation Documentation:

Trust	Name of person consulted* (print)	Designation of signatory	Signature
Chichester	Jon Rabbs		
Dorchester	Phil Wylie		
Hampshire Hospitals Foundation Trust	Pippa Haywood		
Poole	Steve Waddams		
Portsmouth	Jo Borbone		
Salisbury	Rowena Staples		
Southampton	Alice Leahy		
IOW			

*this person agrees they have read the guidelines, consulted with relevant colleagues and members of MDT, managers and patients, young people & their families as appropriate. Any queries raised during consultation and review process should be documented with responses and any changes made to guideline.

Management of Swollen joints in Children

Child presenting with swollen joint

ABCDE approach

History & Examination (PGALS)

SINGLE JOINT

Any history of trauma

- X-ray of the joint
- Consider orthopaedic opinion
- If none-ambulatory or mechanism not explaining the injury consider NAI & senior paediatric review

Any fevers?

- IV access + Bloods (FBC, film, ESR, CRP, U&E, LFT, blood culture, ASOT)
- Imaging of the joint(X-ray or USS)
- Senior paediatric review
- Consider orthopaedic review if septic arthritis suspected
- Consider IV antibiotics if septic arthritis suspected as per Wessex or local microbiology guide

No fever or trauma

- Imaging of the joint (X-ray or USS)
- Bloods (FBC, film, ESR, CRP, U&E, LFT, ASOT, +Lyme serology/TB if history suggestive of risk)
- If non-ambulatory or mechanism not explaining the injury consider NAI
- Consider senior paediatric review
- Discuss with Paediatric rheumatology services in hours on 07824124592/07760158924

MULTIPLE JOINTS

If well and no evidence of poly trauma, assume inflammatory arthritis
If unwell/systemic signs, consider malignancy eg ALL

- Discuss with senior paediatrician
- Discuss with Paediatric rheumatology services in hours on 07824124592/07760158924

Indications for orthopaedic review
Fever
Raised CRP >20 , ESR >40 or WCC elevated neutrophilia
Non-weight bearing in a walking child
Abnormality on X-ray

Indications for discharge
No fever
Normal bloods
Normal X-ray
Well child with normal range of movement in the affected joint
Consider follow up review in 2-3 days

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