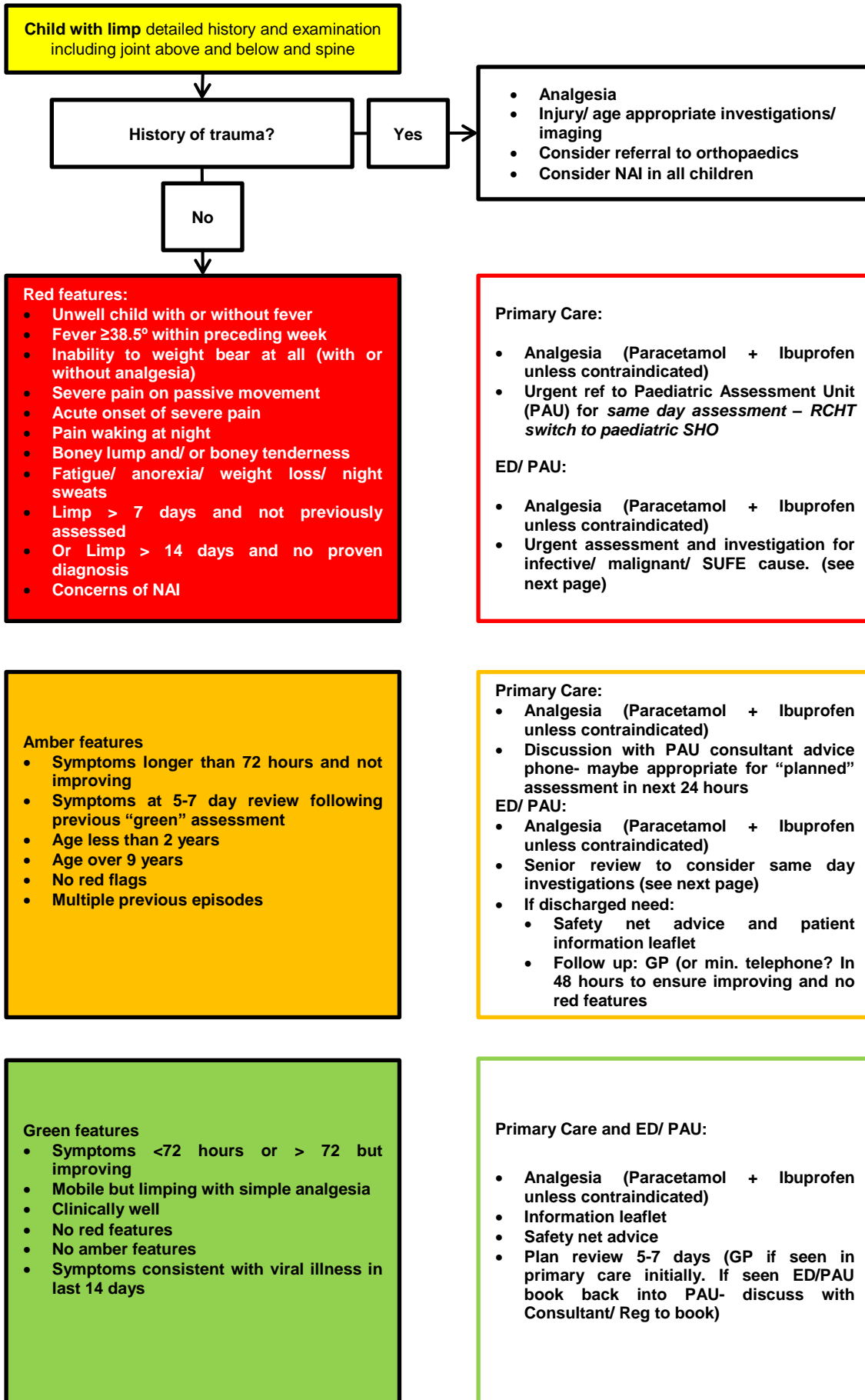


Acute Atraumatic Limp in Children Clinical Guideline

V1.1

June 2021

Summary



Atraumatic limp investigation

Red features on risk assessment:

Significant concern of infective, malignant/ haematological or acute musculoskeletal cause. Therefore investigate immediately with:

- Blood culture
- Full blood count and film
- CRP
 - Consider LDH/ Ferritin/ disease specific investigations
- Plain x-ray (if 9 years or older request AP + frog- lateral film), if bone pain/ tenderness/ lump consider more than the joint
- Consider hip or knee USS (?effusion in septic arthritis or inflammatory condition)

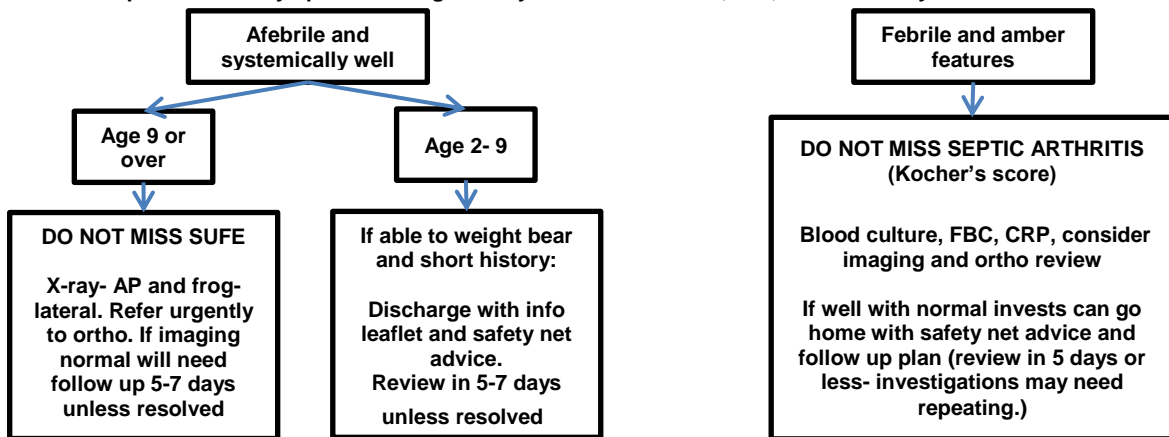
If considering septic arthritis calculate Kocher score:

Fever 38.5°	1
Inability to weight bear	1
ESR >40 or CRP >20	1
WCC >12 x 10 ⁹ /L	1
Fever 38.5°	1

Kocher score:	Risk of septic arthritis
0	<0.2% probability
1	3%
2	40%
3	93.1%
4	99%

No red features on risk assessment (amber):

- If fever is present (≥38°)- low threshold for blood tests, especially if no overtly viral symptoms present
- Transient synovitis is less common below 2 years. Consider other diagnoses and investigate as appropriate. Will need safety net advice and follow up to ensure resolution if well and no cause found. Think of NAI again and consider imaging if any doubt
- All patients with symptoms lasting > 7 days should have FBC, film, CRP and x-ray



Limp differentials for different ages (always consider NAI especially in infants)	Birth – 3 years old	4- 10 years old	10-16 years old
	Septic arthritis	Septic arthritis	Septic arthritis
	Osteomyelitis	Osteomyelitis	Osteomyelitis
	Congenital hip dysplasia	Transient Synovitis	Slipped upper femoral epiphyses
	Toddler's fracture	Perthe's Disease	
	Cerebral palsy	Leukaemia	Solid Bone Tumours
		Juvenile idiopathic arthritis	Rheumatological Disorders
			Overuse injuries

Paediatric Consultant advice phone
07973 742812
Monday- Friday
09:00- 21:00

1. Aim/Purpose of this Guideline

- 1.1. This guideline is intended as a reference tool to aid clinicians to diagnose and manage children presenting to the Children's Emergency Department and Paediatric Assessment Unit with acute painful limp. It is aimed particularly at clinicians assessing children whose symptoms have not yet been diagnosed.
- 1.2. This version supersedes any previous versions of this document.

Data Protection Act 2018 (General Data Protection Regulation – GDPR)

Legislation

The Trust has a duty under the DPA18 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed and documented. We cannot rely on opt out, it must be opt in.

DPA18 is applicable to all staff; this includes those working as contractors and providers of services.

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rch-tr.infogov@nhs.net

2. The Guidance

Limp can be a challenging presentation to diagnose and manage, particularly in small children who may poorly localise their symptoms and be unable to articulate what they are experiencing. Children may limp because they have well-localised pain in a specific joint e.g. transient synovitis (“irritable hip”), septic arthritis or a toddler’s fracture or may have poorly localised symptoms such as referred pain or pain from a bony malignancy or spinal problem. In addition, a limp may be caused by a non-musculoskeletal cause such as abdominal tumour, urinary tract infection or appendicitis.

A handful of conditions account for the majority of presentations, however the list of differential diagnoses is long and clinicians must be vigilant to avoid missing serious pathology on both history and examination which should include a thorough systemic evaluation (including spinal, abdominal and inguinal examination). Pain causing limp can be referred. Therefore, a thorough assessment of joints above and below (including the spine and other relevant body systems) is essential to accurately localise the source

Thorough safety-netting must be done if discharging a child, including use of the department’s patient information leaflet.

2.1. Key Points

- Most children presenting with a limp do not require investigations

- Observing the child's gait may help localise the problem and narrow the differential diagnosis
- Acute inability to walk or weight-bear is a red flag
- Septic arthritis is an orthopaedic emergency and should be considered in all limping children with severe localised joint pain and fever

2.2. Assessment

2.2.1. History

Red flag features highlighted in red:

- **Duration of symptoms >7 days and not previously assessed or duration of symptoms > 14 days and no proven diagnosis**
- History of trauma, falls or injury
- Pattern and severity of pain and limp: **severe localised joint pain or acute onset of severe pain** should raise suspicion for septic arthritis
- **Change to urinary or bowel habit**
- Functional limitations: **complete inability to walk or weight-bear** may indicate significant pathology. A young child with a **below-knee problem may revert to crawling, but a child with a thigh / hip pathology will avoid.**
- **Night pain** and symptoms
- **Systemic symptoms:** fever, night sweats, chills, rigors, rash
- Constitutional symptoms eg unplanned weight loss, lethargy/easy fatigue, anorexia (consider malignancy/haematological cause)
- Recent viral infection (acute myositis, transient synovitis)
- Concerns of NAI?

2.2.2. Examination

LOOK/ FEEL/ MOVE- Spine and joints above and below

- General inspection:
 - behaviour of child, impression well/**unwell**, pallor Petechiae/ purpura/ ecchymosis (consider HSP, malignancy/ haematological cause)
 - Observations/PEWS score.

- Assess gait if possible – walking +/- running
- Joint examination
 - Look: Always compare to other side. Resting limb position, wasting, leg length discrepancy, swelling, deformities, skin changes
 - Feel: heat, cold, tenderness (including calf), crepitus, fluctuance
 - Move:
 - ❖ Active and passive movement (which or both affected?):
 - ❖ Compare range of movement for both sides, as well as. IF restricted is it a specific plane or is it a 'capsular pattern' of restriction? **Marked reduction in range of movement/severe pain on passive** movement is more suggestive of serious pathology such as septic arthritis
 - ❖ Examine for internal rotation of the hip in prone position with knees flexed 90degrees as is the most sensitive test for early loss of hip movement ie a capsular pattern to loss or ROM.
 - ❖ Neurovascular assessment of both limbs
- Tone, power, reflexes, sensation
 - Abdomen, scrotum, back/ spine

2.3. Differential Diagnosis

Birth- 3 Years Old	4- 10 Years Old	10- 16 Years Old
Septic Arthritis	Septic Arthritis	Septic Arthritis
Osteomyelitis	Osteomyelitis	Osteomyelitis
Congenital Hip Dysplasia	Transient Synovitis	Slipped capital femoral epiphyses
Toddler's fracture	Perthe's Disease	Overuse injuries
Cerebral Palsy	Leukaemia	Solid Bone Tumours
	Juvenile Idiopathic Arthritis	Rheumatological Disorders

2.3.1. Osteomyelitis/ Septic Arthritis

This is the main differential diagnosis where there is an unexplained significant limp, and particularly where there is a high fever, high white cell count and CRP. While septic arthritis may occur at any age, it is commonest in infants. CRP >20 has also been shown to be associated with increased infection risk.

Unless the child is septic, do not start antibiotics unless specifically requested to do so by the orthopaedic team. This is to allow synovial fluid, or tissue biopsy, to be obtained before commencing antibiotics

to increase chance of culturing organism, and determining sensitivities.

Late presentation of Developmental Dysplasia of the Hip:

While usually picked up as part of neonatal screening examinations, late presentations can occur. These children will limp from starting to learn how to walk. It is usually associated with asymmetrical skin creases, shortened leg and limitation of flexion in abduction.

2.3.2. Fractures

In toddlers, a minor fall or twist can result in a simple spiral/oblique fracture of the tibia and the parents may not even be able to recall the fall. In non-ambulatory infants, however, any long bone fracture is very concerning for possible NAI, unless a clear history of trauma is given. In older children avulsion fractures, may occur during sudden stressful exertion, e.g. kicking a ball causing an avulsion at the iliac spines.

2.3.3. Irritable Hip/ Transient Synovitis

A very common problem, often following a mild viral infection (35%) and maybe associated with a joint effusion. Commonest from 2-9 years of age. Treatment is conservative with rest and NSAIDS, but where there are significant signs (significant restriction of movement) or symptoms (severe pain), ultrasound-guided aspiration of the joint can be helpful. Ultrasound may also be needed as a diagnostic tool to exclude sepsis in certain situations. Beware of making diagnosis of irritable hip in an infant – much more likely to be infective.

Slipped upper femoral epiphyses (SUFE). This occurs in peri-pubertal children, more common in obese males (65%), but by no means exclusive. Sudden slips may occur with minimal trauma. The condition must be suspected and as simple AP views may not show the slip adequately, frog lateral views are needed. Posterior slips are more common.

2.3.4. Perthes Disease

This may present as recurring limp. Age at presentation: 4-10 years old. X-rays are important to check for changes in either femoral head, where the avascular necrosis occurs but may be normal early in disease process. Cause of condition is unknown but early diagnosis is crucial for optimum outcome. If history suspicious refer for orthopaedic out-patient follow up.

2.3.5. Rheumatological and Inflammatory Conditions

Often associated with other systemic symptoms such as fever and rash. Classically symptoms are worse in the morning and improve during the day. Often multiple joints involved. May require more extensive investigations including – ASO, anti-DNAse B, viral

serology, ANA, autoantibody screen, immunoglobulins and rheumatoid factor. These tests are not routinely carried out in the Paediatric Emergency Department and should only be ordered after senior review.

2.3.6. Overuse/ Stress Injuries

These constitute a group of conditions, most common in athletic adolescents which can vary from mild discomfort on exercise to considerable impairment of sporting ability. They all result from strong muscles pulling on a relatively weak apophysis causing inflammation and pain. They can involve the following areas:

- Iliac crest, anterior superior iliac spine, anterior inferior iliac spine, ischial tuberosity and lesser and greater trochanter
- Lower pole of patellar (Sinding Larsen and Johansson syndrome)
- Tibial tuberosity (Osgood-Schlatter disease)
- Calcaneum (Severs disease)

They are generally treated with rest and NSAID's during symptomatic periods, will resolve once apophyses fuse.

2.3.7. Leukaemia

Limp and bone pain is relatively common at time of presentation (~20%) but very rarely the sole presenting symptom. Other associated symptoms night pain, general malaise, weight loss, hepato-splenomegaly, pallor and bruising.

2.3.8. Solid bone tumours

Commonly associated with night pain and longer history of pain and other systemic symptoms (but need to ask about these). Maybe associated with point tenderness or swelling in bone/limb.

2.4. Investigations

2.4.1. No investigations are indicated if all of the following apply:

- no red flags in the history and physical examination
- ambulating with mild or no discomfort with simple analgesia
- a clear working diagnosis and/or a plan for review within 7 days of onset of limp

2.4.2. Bloods:

- FBC and film should form part of initial screening blood tests if investigation indicated

- Blood cultures (pre-antibiotics ideally) must be taken if child febrile/unwell or osteomyelitis, septic arthritis or septic bursitis are suspected
- Raised inflammatory markers (platelets, WCC, CRP +/- ESR) may suggest infective or inflammatory picture. These may however be normal in contained or more chronic infections

2.4.3. Further bloods will depend on the differentials being considered

2.4.4. Imaging

- X-ray (area of suspicion)
 - AP and lateral frog leg views are useful for identifying:
 - ❖ SUFE
 - ❖ DDH (>6 mo),
 - ❖ Perthes disease
 - ❖ Common pelvic avulsions
 - Frog lateral will not be performed on children under 8 years without specific discussion with Orthopaedic team and/or radiologists.
 - Normal x-ray does not exclude septic arthritis or early osteomyelitis
- Ultrasound (hip)
 - Can assess for presence of drainable effusion when septic arthritis is suspected
 - Presence of an effusion may not differentiate between septic arthritis and transient synovitis of the hip
- Further imaging (eg bone scan or MRI) needs to be discussed with radiology consultant if still limping at 7 days or earlier of clinical concerns from paediatric and/or orthopaedic team.

2.4.5. Discharge and follow up:
See decision tool

3. Monitoring compliance and effectiveness

Element to be monitored	Compliance with policy
Lead	Paediatric guidelines lead
Tool	Individual case review of notes or specific audit tool on a WORD/EXCEL template
Frequency	As Indicated
Reporting arrangements	Child health specialty audit and consultant led clinical guidelines group
Acting on recommendations and Lead(s)	Paediatric consultant Directorate audit and guidelines meeting Required actions will be identified and completed in 3-6 months
Change in practice and lessons to be shared	Required changes to practice will be identified and actioned within 3-6 months. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the ['Equality, Inclusion & Human Rights Policy'](#) or the [Equality and Diversity website](#).

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Document Title	Acute Atraumatic Limp in Children Clinical Guideline V1.1		
This document replaces (exact title of previous version):	Acute Atraumatic Limp in Children Clinical Guideline V1.0		
Date Issued/Approved:	May 2021		
Date Valid From:	June 2021		
Date Valid To:	March 2024		
Directorate / Department responsible (author/owner):	Tom Fontaine; Paediatric Consultant, Lucy Williams; Advanced Paediatric Nurse Practitioner		
Contact details:	01872 253468		
Brief summary of contents	Guidance on management and investigation of limp in children		
Suggested Keywords:	Atraumatic, limp, children, hip pain		
Target Audience	RCHT ✓	CFT	KCCG
Executive Director responsible for Policy:	Medical Director		
Approval route for consultation and ratification:	Child Health Audit and Guidelines meeting		
General Manager confirming approval processes	Mary Baulch		
Name of Governance Lead confirming approval by specialty and care group management meetings	Caroline Amukusana		
Links to key external standards	None		
Related Documents:	None required		
Training Need Identified?	No		
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet & Intranet	✓	Intranet Only
Document Library Folder/Sub Folder	Clinical/ Paediatrics		

Version Control Table

Date	Version No	Summary of Changes	Changes Made by (Name and Job
March 2021	V1.0	Initial issue	Tom Fontaine; Paediatric Consultant
May 2021	V1.1	Formatting and addition of sections 2.2.1 and 2.2.2.	Tom Fontaine; Paediatric Consultant

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.

This document is only valid on the day of printing

Controlled Document

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy for the Development and Management of Knowledge, Procedural and Web Documents (The Policy on Policies). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment Form						
Name of the strategy / policy /proposal / service function to be assessed Acute Atraumatic Limp in Children Clinical Guideline V1.1						
Directorate and service area: Child Health			Is this a new or existing Policy? Existing			
Name of individual/group completing EIA Child Health Audit and Guidelines Group			Contact details: 07834213593			
1. Policy Aim Who is the strategy / policy / proposal / service function aimed at?		Guidance on the investigation and management of atraumatic limp in children				
2. Policy Objectives		Standardised care of children presenting with atraumatic limp				
3. Policy Intended Outcomes		To improve the well-being of patients by offering the appropriate management of patients				
4. How will you measure the outcome?		Audit/ Multidisciplinary team weekly discussion/ incidents/ risk management				
5. Who is intended to benefit from the policy?		Children and families				
6a). Who did you consult with?		Workforce	Patients	Local groups	External organisations	Other
		x				
b). Please list any groups who have been consulted about this procedure.		Please record specific names of groups: Child Health Audit and Guidelines Group				
c). What was the outcome of the consultation?		Approved- 20 th May 2021				

7. The Impact				
Please complete the following table. If you are unsure/don't know if there is a negative impact you need to repeat the consultation step.				
Are there concerns that the policy could have a positive/negative impact on:				
Protected Characteristic	Yes	No	Unsure	Rationale for Assessment / Existing Evidence
Age		X		
Sex (male, female non-binary, asexual etc.)		X		
Gender reassignment		X		
Race/ethnic communities /groups		X		Any information provided should be in an accessible format for the parent/ carer/ patient's needs – i.e. available in different languages if required/access to an interpreter if required
Disability (learning disability, physical disability, sensory impairment, mental health problems and some long term health conditions)		X		Those parent/carer/patients with any identified additional needs will be referred for additional support as appropriate- i.e. to the Liaison team or for specialised equipment. Written information will be provided in a format to meet the family's needs e.g. easy read, audio etc.
Religion/ other beliefs		X		
Marriage and civil partnership		X		
Pregnancy and maternity		X		
Sexual orientation (bisexual, gay, heterosexual, lesbian)		X		
<p>If all characteristics are ticked 'no', and this is not a major working or service change, you can end the assessment here as long as you have a robust rationale in place.</p> <p>I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.</p>				
Name of person confirming result of initial impact assessment:			Child Health Audit and Guidelines group	
<p>If you have ticked 'yes' to any characteristic above OR this is a major working or service change, you will need to complete section 2 of the EIA form available here:</p> <p>Section 2. Full Equality Analysis</p> <p>For guidance please refer to the Equality Impact Assessments Policy (available from the document library) or contact the Human Rights, Equality and Inclusion Lead india.bundock@nhs.net</p>				