Cover page	
Document type	Best Practice Principles
Document name	Management of Bone and Joint Infections
Document location	STPN website
Document target audience	All tertiary specialist centre & District General Hospital (DGH) staff involved in the management of children with bone and joint infections
Document target patient group	Children (under 16)* with a diagnosis of osteomyelitis, septic arthritis, spinal discitis, pyomyositis, fasciitis, panniculitis and cellulitis, concurrent infections of adjacent tissue types
Summary	Bone and joint infection in children can be life threatening or lead to long term disability, so necessitates prompt diagnosis and timely management. The document sets the STPN pathways which are essential for optimal patient outcomes.
Reason for development	The optimum treatment of bone and joint infections is not fully defined. Point 33 of the BSCOS Musculoskeletal Infection Consensus document recommends that each region must agree pathways in which specialist hospitals and supra-regional centres support district general hospitals in managing children with bone and joint infections. Point 16 of the GIRFT Paediatric Orthopaedics and Trauma Surgery sets out recommendations on osteoarticular (bone and joint) infections.
Version	1
Effective from	December 2022
Review date	December 2023
Owner	STPN SIC ODN team
Authors	STPN Orthopaedic Specialty Group
Consultation provided by	
Approved by and date	STPN Orthopaedic Specialty Group on 19/05/2022
Related documents	https://www.bscos.org.uk/consensus/consensus/mskinfection.php and any locally agreed policies which should be followed at all times by local clinical teams.
Document Benefits	
Key Improvements / Benefits	Reduce variation in the management of bone and joint infections across the region to minimise delays to effective treatment, enable optimum recovery, and minimise the sequelae of infection.
Project Evaluation	
Evaluation	Review local implementation of the guideline through the STPN governance forum
Implementation / Recommendations: Next Steps	
Step 1	Share with the STPN Governance Forum
Step 2	STPN should review accessibility of out of hour MRI services to ensure that all children and young people with suspected bone and joint infections are assessed promptly to reduce the incidence of complications.

South Thames Paediatric Network

Management of Bone and Joint Infections

SETTING	South Thames Paediatric Network (STPN)
FOR STAFF	All tertiary specialist centre & District General Hospital (DGH) staff involved in the management of children with bone and joint infections.
PATIENTS	Children (under 16)* with a diagnosis of osteomyelitis, septic arthritis, spinal discitis, pyomyositis, fasciitis, panniculitis and cellulitis, concurrent infections of adjacent tissue types.

*In certain circumstances this document can be used for complex children older than 16 years requiring admission to a specialist paediatric centre.

Overview

Bone and joint infection in children can be life threatening or lead to long term disability, so necessitates prompt diagnosis and timely management. A high-quality, agreed upon standard of care with minimal regional variation is essential for optimal patient outcomes.

This document sets the framework in which specialist hospitals and supra-regional centres support district general hospitals in managing children with bone and joint infections to ensure hospitals in the STPN looking after children with bone and joint infections have formalised pathways and adequate infrastructure to manage these children, enable optimum recovery, and minimise the sequelae of infection.

The document should be viewed alongside the BSCOS Musculoskeletal Infection Consensus Group https://www.bscos.org.uk/consensus/consensus/mskinfection.php and any locally agreed policies which should be followed at all times by local clinical teams.

Definitions

- Local Hospital: interested orthopaedic surgeon and paediatrician/microbiologist. Paediatric inpatient beds.
- Specialist Hospital: interested paediatric orthopaedic surgeons and anaesthetists and interested paediatrician/microbiologist.
- Supra-regional Centre: team of paediatric orthopaedic surgeons, specialist infectious disease paediatricians, and anaesthetic/paediatric critical care support. Able to provide 7 days a week specialist care.

Local Hospital Responsibilities for local management

1. All children suspected to have a bone and joint infection should be considered for shared management by orthopaedic surgeons and paediatricians, especially in cases of diagnostic uncertainty, with further input from an infectious diseases team where required.
2. Admit all children with a suspected bone and joint infection for initial management.

Initial Management

A. Take and document a full history and systematic examination including the upper respiratory tract and ears.
B. Take the following baseline investigations at a minimum:
   - Blood cultures
   - FBC, CRP, ESR
   - AP + lateral radiographs of joint/bone
C. Start empirical IV antibiotics in children who meet sepsis 6 criteria https://sepsistrust.org/professional-resources/clinical-tools/
D. Perform MRI with contrast. Ultrasound of the affected bone/joint should be considered when MRI is not possible.

3. Acute haematogenous osteomyelitis should be managed locally by shared management by an orthopaedic surgeon and a paediatrician by following the steps in section 2 of the BSCOS guide https://www.bscos.org.uk/consensus/consensus/mskinfection.php
4. Clinicians at Local Hospitals should have a low threshold for discussing cases with the designated Specialist Hospital and the designated Supra-regional Centre.
5. Virtual MDTs should be set up amongst the Local Hospitals, the designated Specialist Hospital and the designated Supra-regional Centre to ensure the local team is supported and the patient managed locally safely. Biannual meetings to share learning about challenging patients and pathways should be arranged by the STPN team.
6. If a child is well enough for discharge, but cannot be converted to oral antibiotics and requires long term IV antibiotics for their treatment, then there should be provision for IV treatment as an outpatient or in the community.
7. Consider transfer to the
   A. **designated specialist hospital** where
      - after telephone discussion with the designated Specialist Hospital, surgery is deemed required and the Local Hospital cannot facilitate this;
      - an MRI under GA is needed (in children <7 years of age, or who cannot lie still for a scan) in normal working hours and the Local Hospital cannot facilitate this.
   B. **designated supra-regional centre** where
      - the child is critically ill and requires PICU pre or post-surgery. In this case the local hospital needs to contact STRS for advice and retrieval to an available PICU bed / and or theatre;
      - the child has complex needs and/or the child's pathology has complex presentation
      - an MRI under GA is needed (in children <7 years of age, or who cannot lie still for a scan) out of hours. Currently availability of MRI out of hours varies across the network. The STPN should review capacity as necessary to ensure that all children and young people with suspected bone and joint infections are assessed promptly to reduce the incidence of complications.

Referring Local Hospitals and Specialist Hospitals' Responsibilities Prior to Transfer

8. When inter-hospital transfer is required, the referring clinician will initially make a single call to its designated specialist / Supra-Regional Centre for transfer and then should wait for confirmation/guidance from a named consultant from confirmation from a named specialist orthopaedic consultant. The local hospital will not contact multiple centres simultaneously in order to request a bed.
9. The designated Specialist Hospitals / Supra-Regional Centres for transfer for every Local Hospital is showed in Appendix B.

10. The child/young person and the parents/carer of the child must be informed of the decision, reason and destination before the transfer takes place and their agreement to the transfer must be documented in the patient's notes (see section 1.1 & 1.2 of this document).
11. It is the responsibility of the referring clinician to request the most suitable method of transport which will determine the most appropriate escort during the transfer.
12. If there are any safeguarding concerns they should be acted upon in line with local safeguarding procedures (see section 1.2. of this document).
13. Prior to transfer of a suspected or confirmed infectious patient information/needs will be shared with the ward, receiving unit or hospital (see section 1.3. of this document).
14. For ALL (except STRS) of children BETWEEN hospitals, STOPP form should be completed by the referring hospital (https://stpn.uk/stopp/) to enhance the safety of the transfer.
15. All imaging taken at the Local Hospital should also be sent to the receiving Specialist Hospital / Supra-Regional Centre's paediatric orthopaedic surgeon in charge for the child's care.

Receiving Specialist Hospitals and Supra regional Centre's Responsibilities Prior to Transfer

16. When the designated specialist / supra-regional centre receives the request call they are responsible for reviewing internal bed capacity with the consultant in charge and with the bed management team.
17. The specialist / supra-regional centre will contact the referring clinician within 30min of receiving the call to either confirm availability of a bed there or re-direct them to the other tertiary centres in the STPN.
18. Only when there is no capacity across the STPN, attempts should be made across centres in the NTPN and Southampton. A daily snapshot of bed capacity across the STPN can be accessed on https://stpn.beautifulinformation.org/LogOn?ReturnUrl=%2f
19. If upon arrival accepted transfers are to be tended to by PED, the receiving orthopaedic surgical team should inform their PED department of the incoming transfer.

Receiving Specialist Hospitals and Supra regional Centres Responsibilities for Repatriation

20. Consider repatriation of complex cases from a specialist hospital to their local hospital when treatment plan is finalised.
21. As soon as the child has been assessed, it is the responsibility of the receiving centre to discuss the child's outcome and plan when there is a potential need for specialist follow up care and/or whether repatriation to the child's referring centre is appropriate.
22. If decision on the need for future repatriation of the child is made, it is the responsibility of the specialist centre to contact the referring hospital within 24 hours from the child been assessed and provide an approximate timeframe for repatriating the child back.

Referring Local Hospitals and Specialist Hospitals' Responsibilities for Repatriation

23. It is the responsibility of the child's original referring centre to identify a suitable bed in a timely fashion for repatriating the child once the child no longer needs specialist paediatric input.
24. Once notified of the need for the child to return from the receiving centre the referring centre has 24 hours to repatriate the patient.

Time from referral call made to notification (confirm/re-direct) from tertiary centre:	**Within 30min**
Time from referral accepted to patient admitted for urgent tertiary input (***septic needing urgent surgery***) (Appendix B):	**Within 3 hours**
Time from referral accepted to patient admitted for non-urgent tertiary input (**urgent surgery not immediately necessary**) (Appendix B):	**Within 12 hours**
Notification of clinical status of child / potential repatriation date (from tertiary centre to referring centre):	**Within 48 hours** from assessing the child.
Time from tertiary centre's request for repatriation:	**Within 24 hours**

Failure to meet the above targets should be notified to the STPN england.stpn@nhs.net within 24 hours for governance purposes.

Additional Information

1.1 Patient and family needs

The child and the parents/carer of the child must be informed of the decision, reason and destination before the transfer takes place and their agreement to the transfer must be documented in the patient's notes.
It is also important to keep the family informed about transfer delays to manage their anxiety and expectations.
Children and parents need to understand that their care will be shared between the referring and the receiving centre. Thus they may need to spend time recovering in the referring hospital following surgery /intervention in order to maintain capacity in the tertiary centres.

1.2 Safeguarding assessment and process

1.3 If there are any safeguarding concerns they should be acted upon in line with local safeguarding procedures. Appropriate referrals should be made prior to transfer and it should be documented in the transfer notes who a referral has been made to and what has been said to parents.

1.4 A child or young person with altered behaviour due to mental health problems will require a full medical and CAMHS assessment[1] prior to any transfer to another inpatient facility. After a risk assessment the child or young person should be escorted by an appropriate healthcare professional using a secure ambulance if deemed necessary.

1.5 Delays in determining that there are mental health issues and informing the tertiary centre will delay the transfer. It is the responsibility of the referring centre to ensure that all the relevant physical, social and mental health concerns are notified properly to the receiving hospital. In situations where the information is not available or incorrect then the delay in transfer will sit with the referring centre.

1.6 Infection control assessment and process

Prior to transfer of a suspected or confirmed infectious patient information/needs will be shared with the ward, receiving unit or hospital. The failure to notify the receiving unit of infectious concerns will lead to delays with placing the child into the correct bed and potentially increase of transmission of infection to other in-patient children.

Please consult RCPCH's to minimise nosocomial spread of SARS-CoV-2.

[1] CAMHS provisions may vary, if the patient is critically unwell this assessment should not delay transfer.

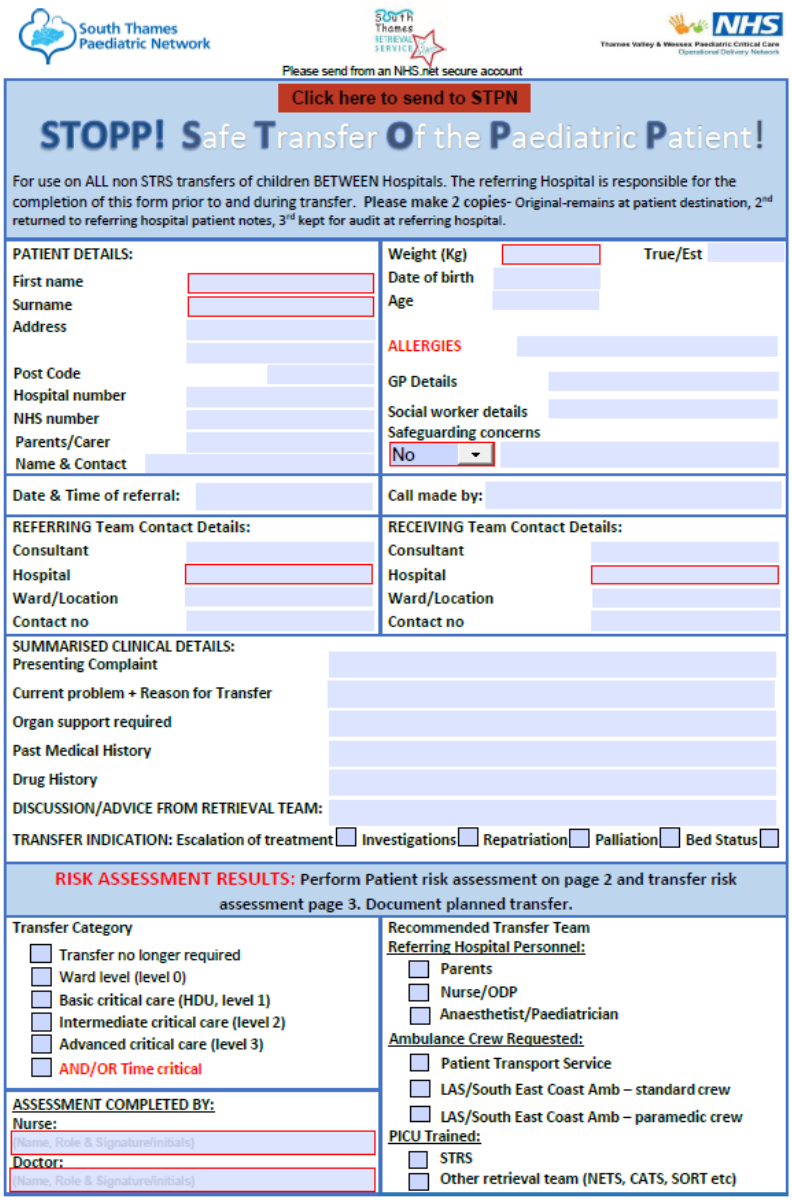
Appendix B – Designated local hospitals, specialist hospitals and supra-regional centres

ICS	Local	Specialist	Supra-regional
SE London	**Lewisham & Greenwich Trust**	Evelina London Children Hospital	Evelina London Children Hospital
	PRUH	King's College Hospital	King's College Hospital
SW London	**Croydon Health Services Trust**	St George's Hospital	St George's Hospital
	Epsom and St Helier Trust	St George's Hospital	St George's Hospital
	Kingston Hospital Trust	St George's Hospital	St George's Hospital
	Royal Marsden Trust	St George's Hospital	St George's Hospital
Surrey	**Ashford and St Peter's Hospitals Trust**	St George's Hospital	St George's Hospital
	Royal Surrey County Hospital Trust (Guildford)	St George's Hospital	St George's Hospital
	Surrey and Sussex Healthcare Trust: Crawley	University Hospitals Sussex	Evelina
	Surrey and Sussex Healthcare Trust: East Surrey	University Hospitals Sussex	Evelina
East Sussex	**East Sussex Healthcare NHS Trust: Eastbourne & Conquest**	University Hospitals Sussex	Evelina London Children Hospital
	East Sussex Healthcare NHS Trust: Hastings & Conquest	Maidstone and Tunbridge Wells	Evelina London Children Hospital
Kent	**Dartford & Gravesham Trust**	Maidstone and Tunbridge Wells	Evelina London Children Hospital
	East Kent Hospitals Trust	Maidstone and Tunbridge Wells	Evelina London Children Hospital
	Medway Trust	Maidstone and Tunbridge Wells	King's College Hospital

Appendix C – Useful Contacts

Useful Contacts / Info								
Name of Hospital		Switchboard	On Call Trauma & Orthopaedic Registrar		Surgical SHO	Bed Manager		
			In Hours	Out of Hours	In Hours	In Hours	Out of Hours	
Supra regional centres	St George's Hospital	0208 672 1255	Bleep 7439	Bleep 7439	-	Bleep 6448	Bleep 6448	
	King's College Hospital	0203 299 9000	Bleep 614	Bleep 614	Bleep 951	Bleep 295	Bleep 295	
	Evelina Children's Hospital	0207 188 7188	Paeds Ortho SpR – BLEEP 0971 OR Ortho / trauma SHO 0559	Ortho/ trauma SHO on call- BLEEP 0559	Bleep 2386	Ext 88766 PNP Bleep 1699 or 0821	PNP Bleep 1699 or 0821	Referral form: https://docs.google.com/document/d/187rceemsEyqYR9hOqAFWwFiGvwbrfkZyJM5iQH1hRfo/edit?usp=sharing Download, complete and email to: gst-tr.elchpaedorthoreferrals@nhs.net
Specialist Hospitals	Sussex University Hospital	**Switchboard** +44 (0)1273 696955 **Trauma Coordinator** 07787271377 (8-5pm)	Bleep 8471	Bleep 8741		Bleep 8651	Bleep 8651	Referral Form: email to bsuh.TraumaCoordinators@nhs.net https://nww.bsuh.nhs.uk/EasysiteWeb/getresource.axd?AssetID=373193&type=Full&servicetype=Attachment
	Maidstone & Tunbridge Wells	01622 729000						

Appendix D –STOPP form https://stpn.uk/wp-content/uploads/2020/10/STOPP-Tool-fillable-digital-version.pdf



South Thames Paediatric Network

Please send from an NHS.net secure account

Click here to send to STPN

STOPP! Safe Transfer Of the Paediatric Patient!

For use on ALL non STRS transfers of children BETWEEN Hospitals. The referring Hospital is responsible for the completion of this form prior to and during transfer. Please make 2 copies- Original-remains at patient destination, 2nd returned to referring hospital patient notes, 3rd kept for audit at referring hospital.

PATIENT DETAILS:

First name
Surname
Address
Post Code
Hospital number
NHS number
Parents/Carer
Name & Contact

Weight (Kg) True/Est
Date of birth
Age
ALLERGIES
GP Details
Social worker details
Safeguarding concerns
No

Date & Time of referral:
Call made by:

REFERRING Team Contact Details:

Consultant
Hospital
Ward/Location
Contact no

RECEIVING Team Contact Details:

Consultant
Hospital
Ward/Location
Contact no

SUMMARISED CLINICAL DETAILS:

Presenting Complaint
Current problem + Reason for Transfer
Organ support required
Past Medical History
Drug History
DISCUSSION/ADVICE FROM RETRIEVAL TEAM:
TRANSFER INDICATION: Escalation of treatment ☐ Investigations ☐ Repatriation ☐ Palliation ☐ Bed Status ☐

RISK ASSESSMENT RESULTS: Perform Patient risk assessment on page 2 and transfer risk assessment page 3. Document planned transfer.

Transfer Category

- ☐ Transfer no longer required
- ☐ Ward level (level 0)
- ☐ Basic critical care (HDU, level 1)
- ☐ Intermediate critical care (level 2)
- ☐ Advanced critical care (level 3)
- ☐ AND/OR Time critical

ASSESSMENT COMPLETED BY:

Nurse:
(Name, Role & Signature/initials)
Doctor:
(Name, Role & Signature/initials)

Recommended Transfer Team

Referring Hospital Personnel:
- ☐ Parents
- ☐ Nurse/ODP
- ☐ Anaesthetist/Paediatrician

Ambulance Crew Requested:
- ☐ Patient Transport Service
- ☐ LAS/South East Coast Amb – standard crew
- ☐ LAS/South East Coast Amb – paramedic crew

PICU Trained:
- ☐ STRS
- ☐ Other retrieval team (NETS, CATS, SORT etc)