Affix Patient Label here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

Worcestershire NHS
Acute Hospitals NHS Trust

CARE PATHWAY FOR CHILDREN AND YOUNG PERSONS WITH FEBRILE NEUTROPENIA, NEUTROPENIC SEPSIS OR SUSPECTED CENTRAL VENOUS LINE INFECTIONS

This Care Pathway has been developed by a multidisciplinary team. It is intended as a guide to care and treatment, and an aid to documenting patient progress. The Care Pathway document is designed to replace the conventional medical and nursing clinical record.

All healthcare professionals are of course free to exercise their own professional judgement when using this pathway. However, if the Care pathway is varied from for any reason, the reason for variation and subsequent action taken must be documented on the multidisciplinary progress notes.

Any comments regarding this Care Pathway should be sent to Dr Baylon Kamalarajan, Consultant Paediatrician (ext 30478 or baylon.kamalarajan@nhs.net)

If you have any problems completing the pathway please contact Dawn Forbes, Clinical Nurse Specialist (ext 30958)

Guidelines referred to when developing this care pathway:
• Worcestershire Royal Hospital: Care pathway for CYP with febrile neutropenia, neutropenic sepsis and suspected central venous line infections (version 2)
• NICE: Neutropenic sepsis: prevention and management of neutropenic sepsis in cancer patients (September 2012)
• Birmingham Children's Hospital: Guideline for the prevention, recognition & management of children & young people with cancer & fever (April 2013)
• Worcestershire Royal Hospital: Guideline for the safe Administration of Chemotherapy for Malignant Disease in Paediatrics (0-16 years old) (WAHT-PAE-074) 2019

Supporting Documentation
• BNF for Children (2020 - 2021)

Affix Patient Label here or record

NAME: . . . . . .

NHS NO: | | | | | | | | | | |

HOSP NO: | | | | | | | | | | |

D.O.B: D D / M M / Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

Aim

To ensure the appropriate treatment and management of children and young persons (CYP) with febrile neutropenia/neutropenic sepsis and minimize the risk of life-threatening sepsis.

Background

CYP with immune deficiencies or who are on immunosuppressive therapy (e.g. those being treated for cancer) are susceptible to life threatening infections, particularly when neutropenic. In addition, most CYP undergoing treatment for cancer have a central venous line (CVL), which can act as a source of infection even if they are not neutropenic.

Definitions

1. *For the purposes of this pathway,* **neutropenia** is defined as having an absolute neutrophil count $\leq 0.5 \times 10^9$/L
2. *For the purposes of this pathway,* CYP are said to be **febrile** if they have a documented temperature $\geq 38^{o}$C
3. **Sepsis** is a complex syndrome compromising a constellation of systemic symptoms and signs in response to infection, including inflammatory, pro-coagulant, and immunosuppressive events
4. **Septic shock** occurs when there is significant hypotension in the presence of sepsis.
5. *For the purposes of this pathway,* a **central venous line** refers to permanent lines such as vascuports and hickman lines; the management of suspected infections in temporary central venous lines is to remove them!

Process

CYP who are known to be at risk of neutropenic sepsis will normally have open access to the ward. These CYP and their families/carers should contact the ward if any of the following conditions are met:

1. The CYP is febrile and known to be neutropenic *or* at risk of neutropenia;
2. The CYP is unwell whilst being treated with immunosuppressive therapy;
3. The CYP has a rigor during/shortly following a central line being accessed in the community

All such CYP should be advised to attend the ward for assessment.

On arrival

1. All patients in this group should be triaged by a nurse on arrival and should be seen by a doctor as soon as possible - the aim is to deliver intravenous antibiotics to those that need them within 1 hour of arrival.
2. If a patient has a temperature of <38°C on arrival to the ward after having had a temperature of 38°C or above at home, you must still commence sepsis pathway.
3. Nursing staff should document the following observations:
    - Temperature, pulse, blood pressure, respiratory rate, O_2 saturation
    - Conscious level (GCS or AVPU score)
    - PEWS score
4. The on-call doctor should then carry out a clinical examination looking for any possible focus of infection including checking the CYP's central line (if in situ) for structural integrity and infection around the exit site. If a child is clinically in shock, remember your ABCs!
5. Mandatory investigations are:
    - U&Es/LFTs/CRP
    - FBC
    - Blood culture
        i. If the CYP has a central line, please culture each lumen individually but a peripheral blood culture is **not** required.
        ii. For children without Central lines, please insert IV access when taking blood and take a peripheral blood culture at the time.
    - Urine for M,C&S (but do not delay antibiotics whilst waiting for sample) **(Ensure "please culture regardless of white cell count" on requestion form)**
    - MRSA swabs
6. Additional investigations if appropriate:
    - CXR
    - Throat swab
    - CVL exit site swab
    - Clotting screen if clinically septic (but please note that many samples taken from CVLs may be contaminated with heparin and thus report a prolonged APTR
    - CPE screening if inpatient in another hospital within the last year

Affix Patient Label here or record

NAME: . . . . . .

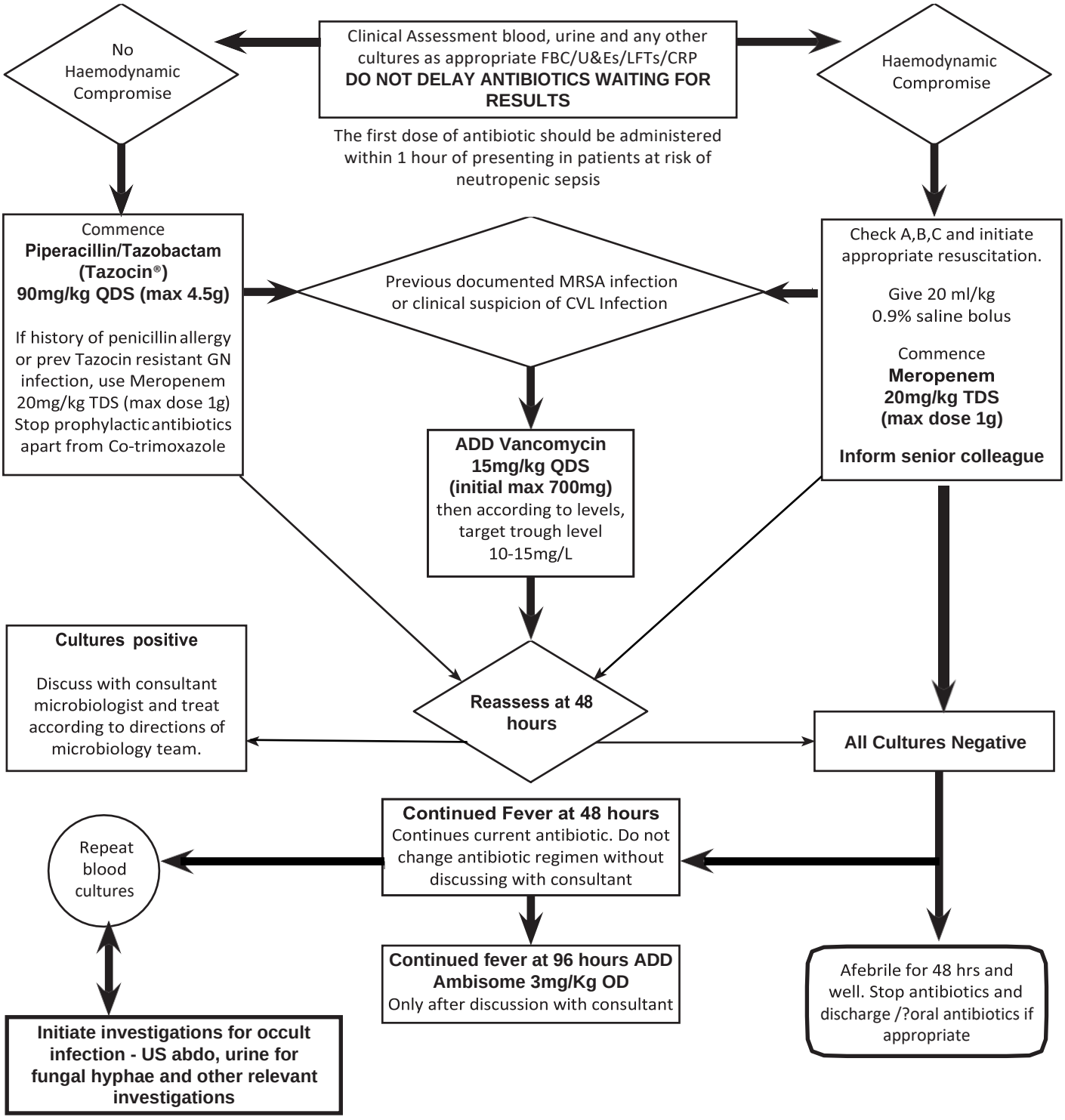
NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

7. Treatment should be ideally initiated as soon as possible after the CYP has been assessed by the paediatric team. The treatment protocol is shown below:



Antipyretic Use

- Paracetamol is the antipyretic of choice: PO (max 20mg/Kg) or IV (max 15mg/Kg) [maximum single dose 1g] PRN (max QDS): **DO NOT GIVE PER RECTUM.**

Affix Patient Label here or record

NAME: . . . . . .

NHS NO: | | | | | | | | | | |

HOSP NO: | | | | | | | | | | |

D.O.B: D D M M Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

Specific Scenarios

1. Any CYP who is currently on chemotherapy (or within 3 months of having completed treatment) and is clinically septic should be treated with broad spectrum antibiotics initially irrespective of neutrophil count.
2. If a child is clinically well (ie stable with no hemodynamic compromise), has no central line and has a neutrophil count >$0.5x10^9$/L, may be discharged on oral antibiotics but only after discussion with Dr Baylon Kamalarajan, Dawn Forbes (CYP Oncology CNS) or the on-call paediatric haematology/oncology consultant at the **Principle Treatment Centre (PTC**).
   This approach is NOT appropriate for children in the following categories:
   - AML
   - ALL not on maintenance treatment
   - Relapsed ALL
   - Children with Down Syndrome
   - Children post-BMT Patients with focal signs of infection
   - Patients with previous admissions for serious bacterial or fungal infection
   - Patients unwilling or unable to take oral antibiotics
   - low confidence in carer response to changes
   - Challenging social circumstances

   If in any doubt - admit and give parental antibiotics.
3. CYP who are suspected of having a line infection but are not neutropenic and are clinically stable may be treated with (intravenous) Teicoplanin alone but please consult Dr Baylon Kamalarajan or the on-call paediatric haematology/oncology consultant at the PTC before initiating this.

Subsequent Management

Daily management

1. The majority of CYP admitted with febrile neutropenia will have short, self-limiting illnesses but some can become very sick and develop fulminant sepsis even after initial stabilization. It is therefore essential that all these patients receive regular daily clinical assessments.
2. All patients should have their FBC/CRP checked every day, ideally done in the morning prior to the ward round. If patients are on maintenance IV fluids then they also require daily U&Es. LFTs to be done daily if abnormal on admission.

Oral chemotherapy

3. Oral chemotherapy should be discontinued on admission. In rare circumstances e.g. during intensification block for leukemia or T-cell lymphoma, Dr Kamalarajan, Dawn Forbes (CYP Oncology CNS) or the on-call paediatric haematology/oncology consultant at the PTC may authorise the continuation of oral chemotherapy. This must be discussed with either of them before authorising continuation.

Further investigations

4. If there is clinical evidence to suggest a focus in the chest, a CXR should be done and *consider* adding in Azithromycin, high-dose Co-trimoxazole or Ambisome®.
5. Further investigations should be directed by clinical progress and findings. Any child who continues to remain febrile after 96 hours must have (or have had) a CXR and an ultrasound scan of the abdomen (looking for fungal deposits); a urine sample for fungal hyphae should also be collected.

Ongoing management

6. All CYP admitted with febrile neutropenia with a clinical, radiological or culture positive bacterial infection must be treated with (a minimum of) 7 days antibiotics; if apyrexial for 48 hours and clinically stable, the course may be completed with the appropriate oral antibiotic. (When dosing oral antibiotics in this group of patients, please use the dose for severe infections.)

Communication with Oncology Team

7. A key aspect of providing care is good communication: please ensure that Dr Baylon Kamalarajan (Consultant Paediatrician) and/or Dawn Forbes (CYP Oncology CNS) are aware of any oncology/malignant haematology patients admitted: next working day is usually sufficient. It is also good practice to inform a patient's Principle Treatment Centre of any admissions but this can be done once the child has started treatment.

Affix Patient Label here or record

NAME: . . . . . .

NHS NO: | | | | | | | | | | |

HOSP NO: | | | | | | | | | | |

D.O.B: D D M M Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

ACTION CHECKLIST		SIGNATURE
TIME ARRIVED ON WARD		
TIME SEEN BY NURSE		
TIME SEEN BY DOCTOR		
TIME OF FIRST ANTIBIOTIC DOSE		

INITIAL OBSERVATIONS		SIGNATURE
TEMPERATURE ON WARD (°C)		
HEART RATE (-/min)		
BLOOD PRESSURE (-/- mmHg)		
RESPIRATORY RATE (-/min)		
02 SATURATIONS (%)		
CONSCIOUS LEVEL (GCS or AVPU)		
PEWS SCORE		

MANDATORY INVESTIGATIONS	TICK WHEN DONE	SIGNATURE
FBC		
U&E/LFTS/CRP		
BLOOD CULTURE(S)		
URINE (DIPSTIX MC&S)		

ADDITIONAL INVESTIGATIONS (IF APPROPRIATE)	TICK WHEN DONE	SIGNATURE
CLOTTING SCREEN		
CVL EXIT SITE SWAB		
CXR		
THROAT SWAB		

All users of this pathway must enter their specimen signature and initials below

PRINT NAME	SIGNATURE	INITIALS	DESIGNATION

Affix Patient Label here or record

NAME: . . . . . .

NHS NO: | | | | | | | | | | |

HOSP NO: | | | | | | | | | | |

D.O.B: D D | M M | Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

DATE:	
TIME:	

Diagnosis				
Most recent chemotherapy (or state where in maintenance)				
Most recent known FBC	**Hb**	**WCC**	**NQ**	**PLT**

History of Presentation

Current Medication/Allergies

Affix Patient Label here or record

NAME: . . . . . .

NHS NO:

HOSP NO:

D.O.B: D D M M Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

DATE:	
TIME:	

Examination

Plan

Affix Patient Label here or record

NAME: . . . . . .

NHS NO: | | | | | | | | | | |

HOSP NO: | | | | | | | | | | |

D.O.B: D D / M M / Y Y Y Y MALE ☐ FEMALE ☐

WARD_____CONS_____

Discussed with:	
Sign/Date/ Designation/GMC #	