



Febrile Neutropenic Patients Management Guidelines

This procedural document supersedes: PAT/EC 5 v.5 – Febrile Neutropenic Patients Management Guidelines



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Executive Sponsor(s):	Medical Director
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Amendment Form

Version	Date	Brief Summary Of Changes	Author
Version 6	11 May 2021	<ul style="list-style-type: none"> • All reference to Haematology ward or ward 18 have been changed to 'Haematology unit'. • Section 3 - Clarification added of trust guidelines identifying neutropenia as $1.0 \times 10^9/l$ where national guidelines define it as $0.5 \times 10^9/l$ • Section 5 – discrepancy of pyrexia definition between haematology and solid tumour patients outlined. Increased detail defining AOT, WPH oncology team, haematology teams and assessing team's duties/responsibilities. Specific instruction for appropriate area of admission updated. Responsibility for PGD 72 updates updated. • Section 6.1 – pyrexia definition for solid tumour patients added. AOT added to those to be made aware of neutropenic septic patients • Section 6.2 – increased detail added regarding initial management of patients and where they should initially present, with differences in haematology/oncology pathways identified. Instruction to use 'Sepsis 6 IPOC' added. • Section 6.5 - Oncologist and AOT added as able to assess patients as low risk • Section 6.6 – Oncology Registrar and AOT role added to patients' ongoing care/management. Instruction to use 'Ongoing monitoring for neutropenic patients during admission' documentation added • Instruction to use 'discharge checklist for patient being discharged while neutropenic' where appropriate added • Line managers for Chatsfield suite and Haematology unit to manage PDG 72 training rather than AOT. Responsibility of AOT to oversee neutropenic sepsis in-house training and maintain e-learning module added. • Section 10 – references reviewed and updated 	Kate Mair

Version 5 (amended 1 Nov 2018)	1 November 2018	<ul style="list-style-type: none"> • Early Warning Score (EWS) replaced with National Early Warning Score (NEWS2). • Appendix 1 – Early Warning Score, has been removed. Staff should refer to Trust policy PAT/T 33 – Physiological Observations and prevention of deterioration in the acutely ill adult. 	Stacey Nutt
Version 5	16 June 2017	<ul style="list-style-type: none"> • Section 6.2 <ul style="list-style-type: none"> - Section made more succinct to make it easier to follow • Section 6.2 <ul style="list-style-type: none"> - Lactate added to investigations • Previous Appendix 1 removed as not relevant 	Stacey Nutt
Version 4	18 March 2015	<ul style="list-style-type: none"> • Section 6.1. added: <ul style="list-style-type: none"> - Hypothermia <35.0°C on two readings 1 hour apart. • Section 6.2 – patients presenting to A/E added: <ul style="list-style-type: none"> - If no bed available at WPH and the patient is fully clerked by medical team the patient can go direct to Haematology Ward if a bed is available • Any reference to haematology CNS changed to Acute Oncology Nurses 	Stacey Nutt Nicky Godfrey
Version 3	November 2012	<ul style="list-style-type: none"> • New style and format included. • This document has been reviewed taking into account recommendations from NICE clinical guideline 151 (2012) • All references to Ward 27 have been replaced with 'Haematology Ward' • Section 3 – neutrophil count redefined to $0.5 \times 10^9/l$ • Section 6 – pyrexia redefined as $38.0^\circ C$ Specific guidance on patients who become afebrile within 48 hours who recover their neutrophils to $>0.5 \times 10^9/l$ • Section 6.2 – oncology patients to be cared for by the admitting acute physicians. • Section 6.4 – Antibiotic treatment removed and link added for 'Policy for treatment of febrile neutropenic sepsis' 	Stacey Nutt

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1. INTRODUCTION

Any infection in a neutropenic patient is a life threatening event, with or without the presence of pyrexia. Any sudden deterioration in a patient who is neutropenic is almost always due to infection and unless there is another obvious cause of the decline, prompt hospitalisation and initiation of broad-spectrum antibiotic therapy should be instigated without any delay (Baluch, A. Shewayish, S, 2019. Warnock C, 2016)

These guidelines are specifically aimed at haematology and oncology patients who become neutropenic following cancer chemotherapy. However, it may be applicable for other haematology and medical patients who develop neutropenia for other reasons. Where possible such patients should be discussed with a Consultant Haematologist and/or Microbiologist.

The guideline should be used in conjunction with the following Trust approved documents:

- Antimicrobial Management of Febrile Neutropenic Sepsis – section 5, Doncaster and Bassetlaw medicines formulary
- Neutropenic Sepsis IPOC - WPR 27351
- PGD 72 – Administration of first dose IV antibiotics for patients with suspected neutropenic sepsis (post chemotherapy).

2. PURPOSE

The purpose of this document is to ensure that the safest and most appropriate action is taken in the management of patients who are febrile and neutropenic, as a consequence of anti-cancer treatment. It is a cancer peer review requirement that there is a clear admission pathway for the management of emergencies such as neutropenic sepsis. This should be directly to an area that has nurses specifically trained in the recognition and management of neutropenic sepsis, so that rapid assessment and administration of first line antibiotics can be achieved within **1 hour** of presentation.

3. DEFINITION - NEUTROPENIA

Neutropenia is defined as a neutrophil count of $<0.5 \times 10^9/l$ (NICE CG151, 2012).

In the interests of prompt treatment and prevention of complicated sepsis the Trust advises neutropenia be identified as neutrophil count of $<1.0 \times 10^9/l$

Do not treat on total WBC count – UNLESS THE TOTAL COUNT IS $<1.0 \times 10^9/l$

This would avoid clinicians waiting for the differential count in severely neutropenic patients, where the machine may not issue an automated differential count and a manual count may take several hours, or days during weekends.

In general, the risk of infection increases with the severity and duration of neutropenia, neutropenic sepsis is the commonest haematological/Oncological emergency and can be fatal. Early diagnosis and prompt antibiotic treatment can prevent death (Keng, M.K., Sekeres, M.A, 2013).

4. EQUALITY IMPACT ASSESSMENT

The Trust aims to design and implement services, policies and measures that meet the diverse needs of our service, population and workforce, ensuring that none are disadvantaged over others. Our objectives and responsibilities relating to equality and diversity are outlined within our equality schemes. When considering the needs and assessing the impact of a procedural document any discriminatory factors must be identified

An Equality Impact Assessment (EIA) has been conducted on this procedural document in line with the principles of the Equality Analysis Policy (CORP/EMP 27) and the Fair Treatment For All Policy (CORP/EMP 4).

The purpose of the EIA is to minimise and if possible remove any disproportionate impact on employees on the grounds of race, sex, disability, age, sexual orientation or religious belief. No detriment was identified. (See Appendix 1).

5. DUTIES AND RESPONSIBILITIES

If a case of neutropenic sepsis is likely, nursing staff must inform the relevant clinician and Acute Oncology Team (AOT). Commence sepsis six IPOC (WPR 44234) if clinically unwell or temperature is elevated (NICE, 2012).

- >37.5°C - solid tumour (oncology patients)
- >38°C - haematology patients

Once neutropenic sepsis is confirmed the assessing doctor or nurse in charge to escalate to relevant Consultant Haematologist (via Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust switch) or Oncologist (via Weston Park Hospital (WPH) on-call Oncology Registrar or DBTH AOT).

Acute Oncology Team role

- To assess patients with suspected or confirmed neutropenic sepsis at the earliest opportunity.
- To provide support and guidance to the responsible clinicians regarding initial and on-going management.
- Ensure the responsible Haematologist/Oncologist is aware of the patient's presentation/admission and liaise as appropriate throughout admission.
- Ensure patients are reviewed daily until the neutropenia is resolved and the patient is stabilised.

- Haematology patients – by the AOT or a senior doctor within the Haematology consulting team
- oncology patients – by AOT team
- Ensure compliance of Patient Group Directive (PGD) 72 by completion of associated audit.

All staff to ensure patients with neutropenic sepsis are admitted to an environment where appropriate skills and expertise are available (UKONS, 2018).

- Haematology patients with neutropenic sepsis should be transferred to the Haematology unit at DRI (Doncaster Royal Infirmary) soon after the administration of first dose antibiotics. If Haematology unit cannot accommodate them for any reason, they should be transferred to the Acute Medical Unit (AMU) before being transferred to the Haematology unit at DRI at the earliest opportunity. If at Bassetlaw Hospital (BH), and neither the Haematology unit or the AMU at DRI can accommodate them, they should be transferred to the Assessment and Treatment Centre (ATC) only before being transferred to DRI at the earliest opportunity.
- Solid tumour (oncology) patients with neutropenic sepsis due to chemotherapy should be transferred to WPH soon after the administration of first dose antibiotics. If for any reason they cannot be transferred, they should be admitted to the Haematology unit at DRI under the care of the admitting consultant physician, with advice from WPH and AOT. If the Haematology unit at DRI cannot accept them for any reason they should be admitted to the AMU before being transferred to WPH or the Haematology unit at the earliest opportunity. If at BH, and neither WPH, Haematology unit or the AMU at DRI can accommodate them they should be transferred to the ATC only before being transferred to WPH or DRI at the earliest opportunity.

Line managers of the Haematology unit and Chatsfield Suite to maintain appropriate training of PGD 72 – for first dose antibiotic administration.

6. PROCEDURE

6.1 Signs of Infection in Neutropenic Patients

Any one of:

- Pyrexia
 - In Haematology patients of $>38.0^{\circ}\text{C}$ on a single reading.
 - In solid Tumour patients of $>37.5^{\circ}\text{C}$ on a single reading.
- Hypothermia $<35.0^{\circ}\text{C}$ on two readings 1 hour apart.
- Rigor or other signs of fever (cold, sweating, shivering).
- Any signs of infection (sore throat, cough, urinary symptoms, and skin lesions).
- Diarrhoea.
- Unexplained hypotension.

- Unexplained tachycardia.
- Any unexplained clinical deterioration, even in the absence of fever.
- Unexplained abdominal pain.

Focal signs of infection may or may not be present.

The oncology or haematology team responsible for the patient, as well as the AOT, should be made aware as soon as possible that the patient has been admitted for suspected neutropenic sepsis.

6.2 Initial Management of Neutropenic Patients

Patients must be advised to present immediately to the Emergency Department (ED), WPH or the Haematology unit at DRI (if bed available) and urgently assessed by staff experienced in managing neutropenic patients. If in any doubt, immediate medical advice should be sought from the on-call consultant Haematologist/Oncology registrar and AOT.

Sepsis six IPOC should be commenced immediately if they are clinically unwell or temperature is raised

- $>37.5^{\circ}\text{C}$ – Oncology patients
- $>38^{\circ}\text{C}$ – Haematology patients

Any patient suspected of being neutropenic should be treated as Neutropenic until the blood count is known.

Haematology Patients

Patients suspected of being neutropenic **will be** assessed urgently by the AOT and treated as per the Antimicrobial Management of Febrile Neutropenic Sepsis guidelines within the Doncaster and Bassetlaw Medicines Formulary (Nov 2018). Immediate contact should be made with the on-call Haematologist. They must be admitted to the Haematology Unit at DRI or, if no bed is available, AMU. Patients who present to BH Emergency Department can be transferred to the ATC until stabilised and a bed on the Haematology Unit or AMU at DRI becomes available. Patients who present to the Chatsfield Suite must be transferred to the Haematology Unit or the AMU.

The following investigations should be undertaken immediately, along with clinical examination, careful history taking and nursing assessment. Look for local signs of infection. All results must be clearly documented in the IPOC for neutropenic sepsis.

- Blood samples for FBC, U+E, LFT, Coagulation screen, CRP, lactate, Group and Save and Calcium – samples for FBC and U+E must be ‘fast tracked’ as urgent.
- Blood cultures from central venous catheter; including each lumen (and clearly identified on labelling which lumen).
- Peripheral blood cultures – these should be taken within 2 hours of blood cultures from the central venous access device.

- Record vital signs and record National Early Warning Score (NEWS2) as per Trust policy (PAT/T 33 Physiological observations and prevention of deterioration in the acutely ill adult).
- Urinalysis
- Sputum specimen – if productive.

Any patient who is suffering from sepsis should be discussed urgently with the on call Haematology Consultant/Oncology Registrar and the Department of Critical Care.

If clinically indicated also order the following:

- Chest X-Ray
- Swab from Hickman/PICC line site, skin lesions, mouth
- Stool specimen if diarrhoea is present with request for *Clostridium difficile*
- During the flu season – all patients admitted with a temperature should have a throat swab sent for respiratory virus.

Avoid invasive procedures, including blood gas analysis, urinary catheterisation, PR examination and IM injections. These are all contraindicated in patients who are neutropenic.

Oncology Patients

Patients will be assessed urgently by the AOT and treated as per the Antimicrobial Management of Febrile Neutropenic Sepsis guidelines within the Doncaster and Bassetlaw Medicines Formulary (Nov 2018). Once stabilised, contact should be made with the WPH on-call Oncology Registrar to arrange transfer. However, if there is no bed available at WPH (document so in the notes) the patient should be transferred to the Haematology Unit or to AMU at Doncaster Royal Infirmary. Patients who present to BH can be transferred to ATC until a bed on the Haematology Unit or AMU at DRI becomes available. The patient will remain under the care of acute physicians for the episode of neutropenic sepsis with advice from the patient's Oncologist.

Investigations should be undertaken immediately as described for haematology patients above

6.3 Central Venous Catheter

Central Venous Catheters (CVC) must be assessed for signs of infection, as the use of these devices increase the risk of infection (Nolan, J. Smith, R. 2013). Signs of infection can include:

- Inflamed exit site/tunnel
- Pyrexia/rigors post flushing

- Previous history of line infection
- Other soft tissue infection
- Where possible the access line should be used for IV antibiotics – if a CVC infection is suspected refer to Management of Catheter Related Bloodstream Infection (CRBSI), including Antibiotic Lock Therapy guidelines within the Doncaster and Bassetlaw Medicines Formulary (Oct 2019) and/or discuss with Microbiologist.
- Any patient with a CVC must be on the Trust CVC IPOC (WPR25856).
- Venous access catheters must not be removed without discussion with the treating consultant. If it is decided the appropriate action is to remove the CVC immediately, the on-call surgical registrar should be contacted.

6.4 Treatment and Management of Neutropenic Patients

If the patient is neutropenic, intravenous fluids, **antibiotic therapy and all prescribed medical treatment must be commenced immediately, without waiting for results from investigations.** Waiting for results before initiating antibiotics could result in a rapid deterioration in the patient's condition. If neutropenic sepsis is a firm clinical suspicion then a first dose broad spectrum antibiotic should be administered immediately (within 1 hour of presentation). The risk of harm to the patient from delayed antibiotic therapy is far greater than that of unnecessary treatment. Full guidance on antibiotic therapy can be found in Section 5 of the Trust Medicines Formulary - Antibiotic Guidelines - 'Antimicrobial Management of Febrile Neutropenic Sepsis'.

6.5 Low Risk Patients

Switch from intravenous to oral antibiotic therapy after 48 hours of treatment in patients whose risk of developing septic complications has been reassessed as low by a Haematology Consultant/Oncologist or the AOT.

6.6 Ongoing Assessment of Patients

1. Nursing staff must ensure that vital signs and NEWS2 are recorded and escalated as per Trust policy PAT/T 33 Physiological observations and prevention of deterioration in the acutely ill adult. **If the patient has an elevated NEWS2 the on-call Consultant Haematologist or on-call Oncology Registrar/AOT MUST also be informed.**
2. If the patient is prescribed blood or platelet transfusions, they should be administered as early in the day as possible. If they are pyrexial prior to transfusion the transfusion must go ahead as it is more imperative in the septic patient that they receive blood product support.
3. A strict record of fluid intake and output must be maintained.

4. Transfers to the Department of Critical Care (DCC) may be necessary following consultation with the on-call Haematology Consultant/Oncology Registrar and the DCC Consultant.
5. Patients with neutropenic sepsis can occasionally appear to have an acute abdomen. The Surgical Team should only be involved after discussion with the on-call Haematology Consultant/Oncology Registrar.

The overview check list for the ongoing management of neutropenic patients during admission, available from the AOT should be used.

6.7 Supportive Management for the Neutropenic Patient

Prompt recognition of early clinical features of infection is crucial in the management of these patients so that infectious complications can be diagnosed early and treatment can be initiated immediately (Ford, A. Marshall, E. 2014).

1. Monitor full blood count, biochemical profile and clotting screen daily.
2. Assess intravenous sites daily for any signs of infection.
3. Assess the patient's oral status every 12 hours (minimum) using a recognised oral assessment guide and monitor for the presence of a sore throat.
4. Assess the patient's skin daily for breakdown, lesions and rashes. Assess any wounds for signs of infection and educate the patient on the importance of scrupulous personal hygiene.
5. Assess for any change in urinary function including frequency, dysuria and haematuria. A routine urine dipstick should be performed daily and acted on accordingly.
6. Assess for any changes in bowel habit.
7. Assess female patients for vaginal candidiasis; instruct patients to avoid the use of tampons.
8. Assess patients for any signs of peri-anal infection.

6.8 General Guidelines for In-Patient Care

1. Patients will be cared for in an environment that minimises the risk of infection from other patients, hospital staff and visitors, preferably in a single, en-suite room.
2. Protected isolation must be clearly indicated by appropriate signage and protective isolation measures taken in accordance with infection control policy.

3. Educate the patient and relatives about the need to restrict visitors who have transmissible illnesses; e.g bacterial infections, herpes, colds, influenza, chickenpox, shingles or measles. Patients must also avoid contact with people who have been recently vaccinated with live or attenuated virus vaccines because of the risk of disseminated disease.
4. Careful hand washing is the single most important action of the health professional, patient, the patient's family and visitors, in preventing cross infection (Hillier, M. 2020).
5. Fresh flowers and plants should not be placed in the patient's room as pathogens could flourish in stagnant water. Denture mugs and soap dishes should also be removed.
6. Food may be a source of infection and dietary restrictions may be necessary (Ball, S et.al 2019). Offer the patient a copy of the Leukaemia and Lymphoma Research booklet for guidance on foods to avoid and handling advice whilst neutropenic. Relatives must be informed of food restrictions when bringing food onto the ward that has been ready prepared – it cannot be re heated in a microwave. Patients and relatives should also be informed not to have 'fast food' brought in for them. Weigh the patient twice a week (recording their MUST score) and refer to the Dietician as appropriate.
7. Face cloths should be avoided and disposable wipes should be provided.
8. Sanitary towels should be used instead of tampons.
9. Ensure patients are encouraged/assisted to shower daily (the shower should be cleaned and disinfected before and after use).
10. Washbowls must be cleaned with hot and soapy water and dried thoroughly.
11. The rooms should be cleaned at least daily and all surfaces damp dusted.

6.9 Discharge of Patients

Patients should not be discharged without agreement of the responsible Haematologist/Oncologist.

Discharge planning should commence once the neutrophil count is greater than $0.5 \times 10^9/l$ or persistent recurrence of infection and fever are reduced (Appleyard, S. 2018 & NICE 2012). Antibiotic treatment should be continued until cultures are negative, sites of infection are resolved and the patient is free of signs and symptoms of neutropenic sepsis. If the patient becomes afebrile within 48 hours and the patient is clinically well, antibiotics can be changed to oral and the patient discharged home.

Upon discharge ensure the patient's follow-up appointment in the Chatsfield Suite or relevant out patient clinic is arranged.

For haematology patients please also inform the Haematology Clinical Nurse Specialists.

When discharging a patient while neutropenic the discharge check list should be referred to and completed. WPR46510/WPR46520 for Oncology/Haematology patients respectively.

7. PATIENTS LACKING CAPACITY

Sometimes it will be necessary to provide care and treatment to patients who lack the capacity to make decisions related to the content of this policy. In these instances staff must treat the patient in accordance with the Mental Capacity Act 2005 (MCA 2005).

- A person lacking capacity should not be treated in a manner which can be seen as discriminatory.
- Any act done for, or any decision made on behalf of a patient who lacks capacity must be done, or made, in the persons Best Interest.
- Further information can be found in the MCA policy, and the Code of Practice, both available on the intranet.

There is no single definition of Best Interest. Best Interest is *determined on an individual basis. All factors relevant to the decision must be taken into account, family and friends should be consulted, and the decision should be in the Best interest of the individual. Please see S5 of the MCA code of practice for further information.*

8. TRAINING AND SUPPORT

Line managers of Haematology unit and Chatsfield Suite to maintain appropriate training of PGD 72 – for first dose antibiotic administration.

Acute oncology Team to oversee education in Neutropenic sepsis supporting in house training as appropriate to ED, Chatsfield Suite and the Haematology unit nursing teams

Acute Oncology Team to ensure AOT E-learning module is up to date.

Lead Chemotherapy Nurse to ensure all nurses trained in the administration of chemotherapy are familiar with the admission process and management of febrile neutropenic patients.

Junior doctors to be made aware of the neutropenic sepsis policy during their Trust induction.

9. MONITORING COMPLIANCE WITH THE PROCEDURAL DOCUMENT

What is being Monitored	Who will carry out the Monitoring	How often	How Reviewed/Where Reported to
Compliance with 1 hour antibiotic administration	Acute Oncology Nurses	Annually	To be reported back to chemotherapy sub-group and reported as part of QST process
Use of protected empty bed	Ward Manager	Ongoing	Ongoing monitoring daily. Exceptions are to be incident reported (via DATIX) and fed back via clinical governance

10. ASSOCIATED TRUST PROCEDURAL DOCUMENTS

Mental Capacity Act 2005 Policy and Guidance, including Deprivation of Liberty Safeguards (DoLS) - PAT/PA 19

Privacy and Dignity Policy – PAT/PA 28

Antimicrobial Management of Febrile Neutropenic Sepsis – section 5, Doncaster and Bassetlaw Medicines Formulary

Management of Catheter Related Bloodstream Infection (CRBSI), including Antibiotic Lock Therapy - section 5, Doncaster and Bassetlaw Medicines Formulary

Neutropenic Sepsis IPOC – WPR 27351

Sepsis 6 IPOC – WPR 44234

CVC IPOC – WPR 25856

PGD 72 – Administration of first dose IV antibiotics for patients with suspected neutropenic sepsis (post chemotherapy).

Physiological observations and prevention of deterioration in the acutely ill adult - PAT/T 33.

Fair Treatment for All Policy – CORP/EMP 4

Equality Analysis Policy – CORP/EMP 27

11. DATA PROTECTION

Any personal data processing associated with this policy will be carried out under 'Current data protection legislation' as in the Data Protection Act 2018 and the UK General Data Protection Regulation (GDPR) 2021.

For further information on data processing carried out by the trust, please refer to our Privacy Notices and other information which you can find on the trust website:

<https://www.dbth.nhs.uk/about-us/our-publications/information-governance/>

12. REFERENCES

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APPENDIX 1 – EQUALITY IMPACT ASSESSMENT - PART 1 INITIAL SCREENING

Service/Function/Policy/Project/ Strategy	Division/Executive Directorate and Department	Assessor (s)	New or Existing Service or Policy?	Date of Assessment
Febrile Neutropenic Patients Management Guidelines PAT/EC 5 v.6	Medicine	Kate Mair	Existing policy	19/08/2020
1) Who is responsible for this policy? Name of Division/Directorate: Medicine				
2) Describe the purpose of the service / function / policy / project/ strategy? – Trust-wide Guidance				
3) Are there any associated objectives? Legislation, targets national expectation, standards – Local and National Standards				
4) What factors contribute or detract from achieving intended outcomes? - None				
5) Does the policy have an impact in terms of age, race, disability, gender, gender reassignment, sexual orientation, marriage/civil partnership, maternity/pregnancy and religion/belief? - No				
<ul style="list-style-type: none"> • If yes, please describe current or planned activities to address the impact [e.g. Monitoring, consultation] 				
6) Is there any scope for new measures which would promote equality? [any actions to be taken - No				
7) Are any of the following groups adversely affected by the policy?				
Protected Characteristics	Affected?	Impact		
a) Age	No			
b) Disability	No			
c) Gender	No			
d) Gender Reassignment	No			
e) Marriage/Civil Partnership	No			
f) Maternity/Pregnancy	No			
g) Race	No			
h) Religion/Belief	No			
i) Sexual Orientation	No			
8) Provide the Equality Rating of the service / function /policy / project / strategy – tick (✓) outcome box				
Outcome 1 ✓	Outcome 2	Outcome 3	Outcome 4	
<i>*If you have rated the policy as having an outcome of 2, 3 or 4, it is necessary to carry out a detailed assessment and complete a Detailed Equality Analysis form in Appendix 4</i>				
Date for next review: Sept 2023				
Checked by: Stacey Nutt			Date: 19/08/2020	