

ANTIMICROBIAL PRESCRIBING POLICY

		POLICY	
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	X		
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Position of Person able to provide Further Guidance/Information	Desi Milanova, Antimicrobial Pharmacist; and Dr Shrikant Ambalkar, Cons Medical Microbiologist		
Associated Documents/ Information		Date Associated Documents/ Information was reviewed	
Not Applicable		Not Applicable	
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1.0 INTRODUCTION

Appropriate use of antimicrobials may be life-saving, but unnecessary overuse can compromise the efficacy of therapy for individuals and the hospital as a whole.

Prudent use of antimicrobials is defined as:

“The use of antimicrobials in the most appropriate way for the treatment or prevention of human infectious diseases, having regard to the diagnosis (or presumed diagnosis), evidence of clinical effectiveness, likely benefits, safety, cost (in comparison with alternative choices), and propensity for the emergence of resistance. The most appropriate way implies that the choice, route, dose, frequency and duration of administration have been rigorously determined.” (Optimising the clinical use of antimicrobials: Clinical Prescribing Subgroup of the Interdepartmental Steering Group on Antimicrobial Resistance 2001).

Prudent use of antimicrobials is essential in the control of development of antimicrobial resistance and in the control of healthcare associated infections, and requires multi-disciplinary collaboration.

It is estimated that about 20% of the antimicrobial prescribing takes place in hospitals and the literature suggests that anything between 20 – 50% of this use is unnecessary. As with all medicines, antimicrobials may cause adverse reactions affecting an individual, but antimicrobial use can also affect the health community, causing healthcare associated infections, a proportion of which are avoidable.

Inappropriate antimicrobial use can cause:

- Adverse medication-related effects for the patient
- Alteration of normal flora leading to superinfection with organisms such as *Pseudomonas aeruginosa*, *Candida spp.*, and *Clostridium difficile*
- Selection of medicine resistant strains e.g. MRSA, ESBL producing gram negative bacilli (Enterobacteriaceae)
- Increased rates of cross infection
- Unnecessary costs.

The Health and Social Care Act 2008 (updated July 2015): Code of Practice on the Prevention and Control of Infections, sets out the 10 criteria against which the Care Quality Commission (CQC) will judge a registered provider on how it complies with the infection prevention requirements. Guidance on meeting Criterion 3 states that providers must ‘ensure appropriate antimicrobial use to optimise patient outcomes and to reduce the risk of adverse events and antimicrobial resistance’.

This will include:

- To have systems in place to manage and monitor the use of antimicrobials
- To have an antibiotic stewardship committee to be responsible for developing, implementing and monitoring the organisations stewardship programme
- To have an antimicrobial policy which will be monitored through regular audit
- To ensure that prescribers receive training in prudent antimicrobial use

A “Start Smart-then Focus” ([Appendix B](#)) approach is recommended for all antimicrobial prescriptions.

2.0 POLICY STATEMENT

The purpose of this policy is to provide a framework to ensure that antimicrobials are used appropriately throughout Sherwood Forest Hospitals NHS Foundation Trust (SFHFT). This will be overseen and monitored by Antimicrobial Prescribing Working Group (APWG), which is a subgroup of the Joint Drugs and Therapeutics/ Medicines Management Committee.

Adherence to the framework specified within this document will enable the SFHFT to achieve compliance with the required healthcare standards as specified in the The Health and Social Care Act 2008 Code of Practice of the prevention and control of infections and related guidance (2015)

This clinical policy applies to:

Staff group(s)

- All staff involved in the prescribing, administration and monitoring of antimicrobial agents within SFHFT

Clinical area(s)

- All in-patient and ambulatory units where patients can be prescribed antimicrobial agents
- All sites

Patient group(s)

- All in-patients prescribed antimicrobial agents
- Ambulatory patients (incl OPAT, SDEC)
- Adult, maternity and paediatric patients

Exclusions

- Outpatient units (Emergency Department, Minor Injuries Unit, Clinics) are excluded from this policy, but all antimicrobial prescriptions from these areas must follow local or national antimicrobial guidelines.

3.0 DEFINITIONS/ ABBREVIATIONS

The Trust:	means the Sherwood Forest Hospitals NHS Foundation Trust
Staff:	All employees of the Trust including those managed by a third party organisation on behalf of the Trust.
Antimicrobial agent	Antibiotic, antiviral or antifungal medication for the treatment of bacterial, viral or fungal infections respectively
Prescriber	A registered practitioner who is legally authorised to undertake independent or supplementary prescribing according to current legislation (medical doctor or a registered nurse, pharmacist or other healthcare professional who has successfully undertaken a non-medical prescribing qualification).
Antimicrobial resistance (AMR)	Resistance of a microorganism to an antimicrobial drug that was originally effective for treatment of infections caused by it and applies to antivirals, antifungals, antiparasitics and antibiotics.
Antimicrobial stewardship (AMS)	The use of coordinated interventions to improve and measure the use of antimicrobials by promoting optimal drug regimen, dose, duration and route. The aim is for optimal clinical outcome and to limit selection of resistant strains.
Antimicrobial stewardship ward round:	This is a regular multi-disciplinary ward round undertaken by a microbiologist, antimicrobial pharmacist and sepsis (infection) nurse. The purpose of the ward round is to clinically assess the appropriateness of the antimicrobials prescribed for individual patient. Any recommendation to change the antimicrobials prescribed is discussed with the clinical staff on the wards and documented in the medical notes.
Antimicrobial Prescribing Working Group (APWG)	a multidisciplinary team, which includes a consultant microbiologist, antimicrobial pharmacist, an acute care physician, a surgeon and a senior nurse to ensure a multidisciplinary approach and improve engagement across the organisation.
Local Antimicrobial Prescribing guidelines	Guidelines for treatment of specific infections and guidelines for surgical prophylaxis that can be found on the Trust's Antibiotics Website
EPMA	Electronic Prescribing and Medicines Administration system - NerveCentre
MRSA	Meticillin Resistant <i>Staphylococcus aureus</i>
ESBL	Extended Spectrum β -lactamase

4.0 ROLES AND RESPONSIBILITIES

Medical doctors and non-medical prescribers must be familiar with and adhere to this policy in addition to local antimicrobial prescribing guidelines.

4.1 The Medical Director will:

- Act as a Board level champion to promote prudent prescribing throughout the organisation.

4.2 The Divisional Directors will:

- Work collaboratively with prescribers, pharmacists, ward leaders and heads of nursing to ensure that antimicrobial prescribing standards are followed within the division and antimicrobials are prescribed and reviewed in accordance with local antimicrobial guidelines.
- Support the implementation of the antimicrobial audit programme.
- Ensure that antimicrobial prescribing and antimicrobial consumption data are reviewed regularly at divisional governance meetings and appropriate action taken as required.

4.3 The Antimicrobial Prescribing Working Group (APWG) will:

- Ensure that evidence-based local antimicrobial guidelines are in place and reviewed regularly.
- Ensure regular auditing of the guidelines, antimicrobial stewardship practice and quality assurance measures.
- Formally review the organisation's retrospective antibiotic consumption data (especially highlighting the use of broad-spectrum antibiotics such as cephalosporins, quinolones and carbapenems), and report to divisions as appropriate.
- Identify actions to address: non-compliance with local guidelines; general antimicrobial stewardship issues; and other prescribing issues.

4.4 The Antimicrobial Pharmacist will:

- Coordinate audits to assess compliance with the Antimicrobial Prescribing Policy and Trust's local antimicrobial prescribing guidelines.
- Coordinate the antimicrobial stewardship ward rounds.
- Investigate cases of non-compliance referred by the ward pharmacists, and resolve through education or escalation as appropriate.
- Produce reports of Antimicrobial consumption data for review by APWG.

4.5 Prescribers will:

- Prescribe antimicrobials on EPMA or in the dedicated antimicrobial prescribing section of the medication chart (in areas where EPMA is not yet in use), in accordance with the standards set within this policy and the local antimicrobial prescribing guidelines relevant to their area(s) of work.
- Make sure that any deviation from the guidelines is clearly documented in the patient's medical notes.
- Where a Trust guideline does not exist, prescribing should follow recognised practice supported by appropriate professional bodies or recognised references.

- Prescribing of Restricted Antimicrobials should follow [Appendix E](#).
- Check allergy status of the patient and document any allergies clearly in the notes and on EPMA (or on the medication chart, if EPMA not in use) including the nature of the allergy.
- Document details of antimicrobial prescribing in medical notes and on EPMA (or on the medication chart if EPMA not in use) (See [Appendix A](#)).

4.6 Registered nurses will:

- Ensure that antimicrobial treatment is started as soon as possible and that doses are not omitted or delayed.
- Where a prescribed antimicrobial is not routinely held on the ward, nursing staff must ensure that pharmacy staff are informed immediately to prevent delays in treatment.
- Ask a doctor to review if a number of doses have been missed during the prescribed course, especially if the patient is still unwell or approaching a weekend where regular review is unlikely.
- Check that the allergy status box has been completed for the patient before administering any antibiotics.
- Request that prescribers include an indication for the antimicrobial and a valid duration/review date on EPMA (or the medication chart if EPMA not in use) where no review/duration or indication is documented (see [Appendix A](#)).
- Immediately contact the prescribers for all prescriptions continuing beyond the stated review date. Whilst awaiting review, continue to administer the antimicrobial.
- “Ensure administration of Intravenous (IV) antibiotics in adults follows [Appendix F](#) or, if not listed, other recognised information sources (Medusa, product literature/ SPC)”

4.7 Clinical pharmacists will:

- Ensure that antimicrobial prescribing is in line with Trust policy and local antimicrobial prescribing guidelines.
- Ensure that documentation of antimicrobial prescribing in accordance with the policy (see [Appendix A](#)).
- Liaise with pharmacy department to ensure the timely supply of antimicrobial medications to wards where appropriate.
- Escalate non-compliance with the Antimicrobial Prescribing Policy and/or local antimicrobial guidelines to the Antimicrobial Pharmacist

4.8 The Microbiologists will:

- Provide expert advice to prescribers and pharmacists on the use of antimicrobial medicines and the management of infections.
- Liaise with clinicians to produce and update antimicrobial prescribing policies and local guidelines as required.
- Carry out regular multi-disciplinary ward rounds in collaboration with the antimicrobial pharmacist, with the aim of improving antimicrobial prescribing and providing interactive education on the wards

5.0 APPROVAL (v4.0)

Contributors	Via	Timing
Consultant microbiologist, Antimicrobial pharmacist, Infection control nurse consultant, Sepsis nurse, Medicines safety pharmacist	Trust email	April 2021
Members of the Antimicrobial Prescribing Working Group	APWG	June 2021

6.0 DOCUMENT REQUIREMENTS

- 6.1 The standards for general prescribing (refer to [The Medicines Policy](#), Section 10) must be adhered to when prescribing antimicrobial medication.
- 6.2 Antimicrobial therapy should not be prescribed until the allergy status of the patient has been confirmed and documented in the medical notes and EPMA (or on the prescription chart if EPMA not in use).
 If the allergy status for the patient cannot be confirmed, antimicrobial therapy can be given if the clinical circumstances dictate that a delay in treatment may be detrimental to the patient. The prescriber must document this information in the allergy box e.g. "Unable to confirm allergy status – Signature + Date" and the allergy status confirmed as soon as possible. For antibiotics in penicillin allergy see [Appendix D](#).
- 6.3 Relevant clinical specimens for culture and sensitivity testing must be obtained prior to antimicrobial administration unless immediate empirical treatment is indicated.
- 6.4 Antimicrobial therapy should only be prescribed if clinically indicated according to the patient's clinical signs/symptoms of infection. The following information must be documented in the medical notes and on EPMA (or the medication chart if EPMA not in use):
- In medical notes
 - Indication for prescription/diagnosis (suspected diagnosis)
 - Evidence of assessment of severity (may include temperature, heart rate, respiratory rate, blood pressure, full blood count, CRP)
 - Details of samples taken for culture and sensitivity
 - Name of antimicrobial agent, dose and route of administration
 - Duration of treatment or treatment review date
 - On EPMA (or patient's medication chart if in area where EPMA is not in use)
 - Name of antimicrobial agent, dose and route of administration
 - Indication for antimicrobial treatment
 - Duration of treatment or treatment review date
- 6.5 The prescriber must write a review date or duration of the treatment on EPMA (or the medication chart if EPMA not in use) at the point of prescribing. This should be updated according to the patient's clinical condition.
- 6.6 Patients with high risk sepsis must have the first dose of antimicrobial therapy administered as soon as possible and no later than one hour after recognising high risk sepsis ([NICE Guideline NG51](#))
- 6.7 Empirical antimicrobial prescription should be reviewed on regular (preferably daily) basis after starting treatment and the prescription promptly changed to narrow spectrum agent to reflect culture & sensitivity results where necessary. All antimicrobial treatment should be reviewed at 48-72 hours after initiation and there should be clear documentation of the antimicrobial prescribing decision on EPMA (or the medication chart if EPMA not in use) and fully in the medical notes.

- 6.8 If therapy is to continue longer than 7 days, this must be clearly documented in the patient's medical notes and a new review date documented on EPMA (or the medication chart if EPMA not in use).
 The following conditions normally require an extended course of antimicrobial treatment and advice should be sought from microbiology (NB this is not an comprehensive list)
- Acute prostatitis
 - Endocarditis
 - Septic arthritis
 - Empyema
 - Osteomyelitis
 - Meningitis/brain abscess
 - *Staphylococcus aureus* bacteraemia
 - Tuberculosis (Respiratory consultant advice)
- 6.9 Intravenous antimicrobial therapy should be reviewed daily, but no later than 48-72 hours after commencing treatment and if possible the patient should be switched to oral antimicrobial treatment. Advice on switching to oral treatment can be found at [Appendix C](#). If continuation of intravenous treatment is required this must be clearly documented in the patient's medical notes along with a date for further review. OPAT patients to be reviewed at a weekly MDT in accordance with the 'OPAT Antimicrobial Therapy Policy'.
- 6.10 Antimicrobial treatment should be prescribed in accordance with local prescribing guidelines. When local guidelines are not available the BNF or national guidelines should be followed or the advice of a specialist sought.
- 6.11 Antimicrobial therapy should be prescribed at the dose and frequency appropriate for the site and severity of infection and co-existing clinical factors (i.e. impaired renal or hepatic function).
- 6.12 Antibiotic doses may be missed for a number of reasons (e.g. no cannula, unable to swallow. This should be clearly documented on EPMA (or the medication chart if EPMA not in use) and patients should be reviewed clinically and consideration given for re-prescribing additional doses if required.
- 6.13 Antimicrobial prophylaxis for surgery should be prescribed in line with the Trust's surgical prophylaxis guidelines (see [Antibiotic Website](#) for details).
- The clinical indication for antimicrobial prophylaxis must be recorded in the patient's medical notes and EPMA (or the medication chart if EPMA not in use) or the anaesthetics record; whichever is most practical at the time.
 - Established infection discovered during surgery is an indication for converting antimicrobial prophylaxis into antimicrobial treatment
- 6.14 Restricted antimicrobials should be prescribed in line with [Appendix E](#).

7.0 MONITORING COMPLIANCE AND EFFECTIVENESS

- 7.1 Audit of antimicrobial prescribing and use will be facilitated and monitored on a 6-monthly basis by each speciality. The current electronic data collection tools are hosted via the AMaT system. Results and actions from the audit will be reported to the Divisional Directors and Director of Infection Prevention and Control (DIPC) via Divisional Clinical Governance meetings and the Infection Prevention and Control Committee respectively.
- 7.2 Antimicrobial stewardship ward round will be undertaken three times a week by a Microbiology consultant, Antimicrobial Pharmacist and Sepsis (Infection) Nurse. One of the objectives for this MDT-round will be to assess the appropriateness of antimicrobial prescribing, compliance with this Policy and address poor prescribing practice. Direct feedback will be given to the clinical teams.
- 7.3 Incidents monitoring (via DATIX) will be done ad-hoc in response to incidents. Datix handler can escalate through organisational management structure as needed.

Minimum Requirement to be Monitored (WHAT – element of compliance or effectiveness within the document will be monitored)	Responsible Individual (WHO – is going to monitor this element)	Process for Monitoring e.g. Audit (HOW – will this element be monitored (method used))	Frequency of Monitoring (WHEN – will this element be monitored (frequency/ how often))	Responsible Individual or Committee/ Group for Review of Results (WHERE – Which individual/ committee or group will this be reported to, in what format (eg verbal, formal report etc) and by who)
Documentation of allergy status. Documentation of indication and duration of antibiotic treatment. Evidence of review within 72 hrs	Each Specialty (via their respective Specialty Clinical Governance Lead / Specialty Clinical Audit Lead	Antimicrobial prescribing audit (via AMaT)	Audit is done at least 6-monthly	Results are discussed in Speciality / Divisional Clinical Governance meetings; Infection Prevention and Control Committee (IPCC) and APWG
Appropriateness of antibiotic prescribing.	Microbiology consultant, Antimicrobial Pharmacist and Sepsis Nurse	Antimicrobial stewardship ward round	3 times a week	MDT members feedback directly to prescribers

Minimum Requirement to be Monitored (WHAT – element of compliance or effectiveness within the document will be monitored)	Responsible Individual (WHO – is going to monitor this element)	Process for Monitoring e.g. Audit (HOW – will this element be monitored (method used))	Frequency of Monitoring (WHEN – will this element be monitored (frequency/ how often))	Responsible Individual or Committee/ Group for Review of Results (WHERE – Which individual/ committee or group will this be reported to, in what format (eg verbal, formal report etc) and by who)
Incidents related to antibiotic treatment – for example incorrect prescribing or administration; omitted allergy status	Datix handler	Review of individual incidents via the Datix system	Ad-hoc, in response to incidents	Datix handler can escalate through organisational management structure

8.0 TRAINING AND IMPLEMENTATION

- 8.1 All antimicrobial prescribers need to familiarise themselves with the Trust's local Antimicrobial prescribing guidelines available on the intranet via the Trust [Antibiotic website](#)
- 8.2 All new medical staff will receive antimicrobial prescribing guidance from the Trust's Antimicrobial pharmacist or Consultant microbiologist as part of their induction programme.
- 8.3 Education and training covering appropriate prescribing of antimicrobials and the management of the patients with infections will be part of the mandatory training for F1/F2 junior doctors. This training will be delivered by Consultant microbiologist and/or Antimicrobial pharmacist.
- 8.4 Nursing staff will receive an annual update on Infection Control, sepsis and antimicrobial stewardship as part of the Mandatory Update programme.

9.0 IMPACT ASSESSMENTS

- This document has been subject to an Equality Impact Assessment, see completed form at [Appendix G](#)
- This document is not subject to an Environmental Impact Assessment

10.0 EVIDENCE BASE (Relevant Legislation/ National Guidance) AND RELATED SFHFT DOCUMENTS

Evidence Base:

- Wise *et al.* Antimicrobial resistance. BMJ 1998; 317:609-610
- Optimising the clinical use of antimicrobials: Report from the Clinical Prescribing Subgroup of the Interdepartmental Steering Group on Antimicrobial Resistance June 2001 ([link here](#))
- Antimicrobial Stewardship – Start Smart, then Focus. Antimicrobial Stewardship Toolkit for English Hospitals . 2015 Department of Health
http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_131181.pdf accessed 15/5/18
- The Health and Social Care Act 2008 (Updated July 2015): Code of practice for the prevention and control of healthcare associated infections
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/449049/Code_of_practice_280715_acc.pdf accessed 15/5/18
- Winning Ways: Working together to reduce Healthcare Associated Infection in England, Dec 2003.
http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/browsable/DH_4095070
- NICE Guideline NG51 Sepsis: recognition, diagnosis and early management (2016)
- NICE NG125 Surgical site infections: prevention and treatment (2019)

Related SFHFT Documents:

- Trust's Local Antimicrobial Prescribing Guidelines (located on the [Antibiotic website](#))
- Medicines Policy - [Medicines Policy \(nnotts.nhs.uk\)](https://www.nnotts.nhs.uk/medicines-policy)
- Outpatient Parenteral Anti-microbial Therapy (OPAT) Policy

11.0 KEYWORDS

Antibiotic, infection, prophylaxis, treatment, prescription, prescribe, therapy, guidance notes for switch switching from IV to oral antibiotics, antibiotics in penicillin allergy,

12.0 APPENDICES

- [Appendix A](#) – Example Antimicrobial Prescription on EPMA and Medication Chart
- [Appendix B](#) – The Department of Health Antimicrobial Stewardship Treatment Algorithm
- [Appendix C](#) – guidance notes for switching from IV to Oral antibiotics
- [Appendix D](#) – Antibiotics in Penicillin Allergy
- [Appendix E](#) - Restricted Antimicrobials List
- [Appendix F](#) – Methods of IV administration of commonly used antibiotics in adults
- [Appendix G](#) – Equality Impact Assessment Form (EQIA)

Appendix A: Example Antimicrobial Prescription on EPMA and Medication Chart

- Initial empirical prescription – prescriptions must include:
 - Name of antimicrobial agent, dose and route of administration
 - Indication for antibiotic treatment
 - Review date (within 48-72hrs)

Antimicrobial Flucloxacillin			DATE	15/5	16/5	17/5	/	/	/	/	/	/	/	/
Dose 2g			Circle or state time	Day 1	Day 2	Day 3 Sign for 72 hour review	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11
Route IV														
Start Date 15/5			06											
Time prescribed 14:00			08											
Indication/Additional instructions cellulitis			12											
Stop/Review Date 17/5			14											
Signature AD			18											
Print Name A. Doctor			22											
Pharmacist check			If for infusion state:			Fluid	0.9% NaCl			Volume (ml)	100ml	Rate (ml/hour)	100ml/h	

Medicine	Ph	Today	Fr 06-May	Sa 07-May	Su 08-May
Flucloxacillin	✓ Morning		+	+	+
Intravenous, 2000 mg four times a day	New Afternoon	Due	+	+	Review
Prescriber: epma jdc01 Prescribed start time: Thu 05-May-2022 13:00	Evening	+	+	+	+
Indication: cellulitis	Night	+	+	+	+
Show all 4 prescriptions for Flucloxacillin					

- IV to PO switch – prescriptions must include:
 - Name of antimicrobial agent, dose and route of administration
 - Indication for antibiotic treatment
 - Duration of treatment or further review date

Antimicrobial Flucloxacillin			DATE	15/5	16/5	17/5	/	/	/	/	/	/	/
Dose 2g			Circle or state time	Day 1	Day 2	Day 3 Sign for 72 hour review	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Route IV													
Start Date 15/5			06										
Time prescribed 14:00			08										
Indication/Additional instructions cellulitis			12										
Stop/Review Date 17/5			14										
Signature AD			18										
Print Name A. Doctor			22										
Pharmacist check			If for infusion state:			Fluid	0.9% sodium chloride			Volume (ml)	100ml	Rate (ml/hour)	100ml/h

Antimicrobial Flucloxacillin			DATE	/	/	17/5	18/5	19/5	20/5	21/5	22/5	/	/	/
Dose 1g			Circle or state time	Day 1	Day 2	Day 3 Sign for 72 hour review	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11
Route PO														
Start Date 17/5			06											
Time prescribed 17:30			08											
Indication/Additional instructions cellulitis			12											
Stop/Review Date 22/5			14											
Signature AD			18											
Print Name A. Doctor			22											
Pharmacist check			If for infusion state:			Fluid	Volume (ml)			Rate (ml/hour)				

Medicine	Ph	Today	Fr 06-May	Sa 07-May	Su 08-May	Mo 09-May	Tu 10-May
Flucloxacillin capsule	✓ ☰ Morning		+	+	+	+	+
Oral, 1000 mg four times a day for 5 days	New Afternoon	Due	+	+	+	+	
Prescriber: epma idoc1	Evening	+	+	+	+	+	
Prescribed start time: Thu 05-May-2022 13:00	Night	+	+	+	+	+	
Indication: cellulitis							
Show all 5 prescriptions for Flucloxacillin capsule							

3. Prescribing “stat” infusions of antibiotics on prescription chart must include:
– entry on the infusion side of the prescription chart

DATE	INFUSION FLUID		ROUTE	ADDITIVES (if any)		DURATION or RATE	Prescribers Signature	Pharmacy Check	Additive added by:	Checked by:
	APPROVED NAME, STRENGTH	VOLUME (ML)		APPROVED NAME	DOSE					
27/4/18	Sodium Chloride 0.9%	100 ml	IV	Gentamicin	320mg	60min	DL			

- reference on the “Stat” side of the drug chart

ONCE ONLY MEDICINES, PREMEDICATION, ANTIBIOTIC PROPHYLAXIS and PATIENT GROUP DIRECTIONS									
Date	Medicine	Dose	Route	Instructions	Time req'd	Prescriber's Sig. Print Name (& 'PGD' if required)	Time Given	Sig(s). Given	Pharm. Check
27/4/18	Gentamicin	see infusions section			11:30				

4. Prescribing Vancomycin using supplementary auto-prescription:
- On EPMA – prescribe a “placeholder” then use the auto-prescription available on the Antibiotic website to generate a supplementary paper prescription (as shown overleaf)

Vancomycin infusion - see paper supplementary chart	✓ ☰ Morning								
Intravenous, 1 dose four times a day	New Afternoon								
Prescriber:	S Evening								
Prescribed start time: Tue 30-May-2023 22:00	Night								
Instructions: Refer to Vancomycin supplementary chart to check if administration is due. Ensure administration is recorded fully on the supplementary chart.									

- If using prescription chart, refer to the additional chart on the front of the main ‘Medicine Prescription and Administration Record’ as shown below

Other medicine charts/sections in use (TICK)			
Insulin	<input type="checkbox"/>	Ophthalmology	<input type="checkbox"/>
TPN/Nutrition	<input type="checkbox"/>	Intrathecal	<input type="checkbox"/>
SC Syringe Driver	<input type="checkbox"/>	Chemotherapy	<input type="checkbox"/>
IV Heparin	<input type="checkbox"/>	Critical Care Infusion	<input type="checkbox"/>
Anticoagulation	<input type="checkbox"/>		
Additional 'Prescriptions for Infusions'	<input type="checkbox"/>		
PCA/Epidural/Regional anaesthesia	<input type="checkbox"/>		
Midwives Exemption Record	<input type="checkbox"/>		
Others (specify) <u>Vancomycin</u>	<input checked="" type="checkbox"/>		

- Prescribe on the Antimicrobials section of the ‘Medicine Prescription and Administration Record’ as shown below

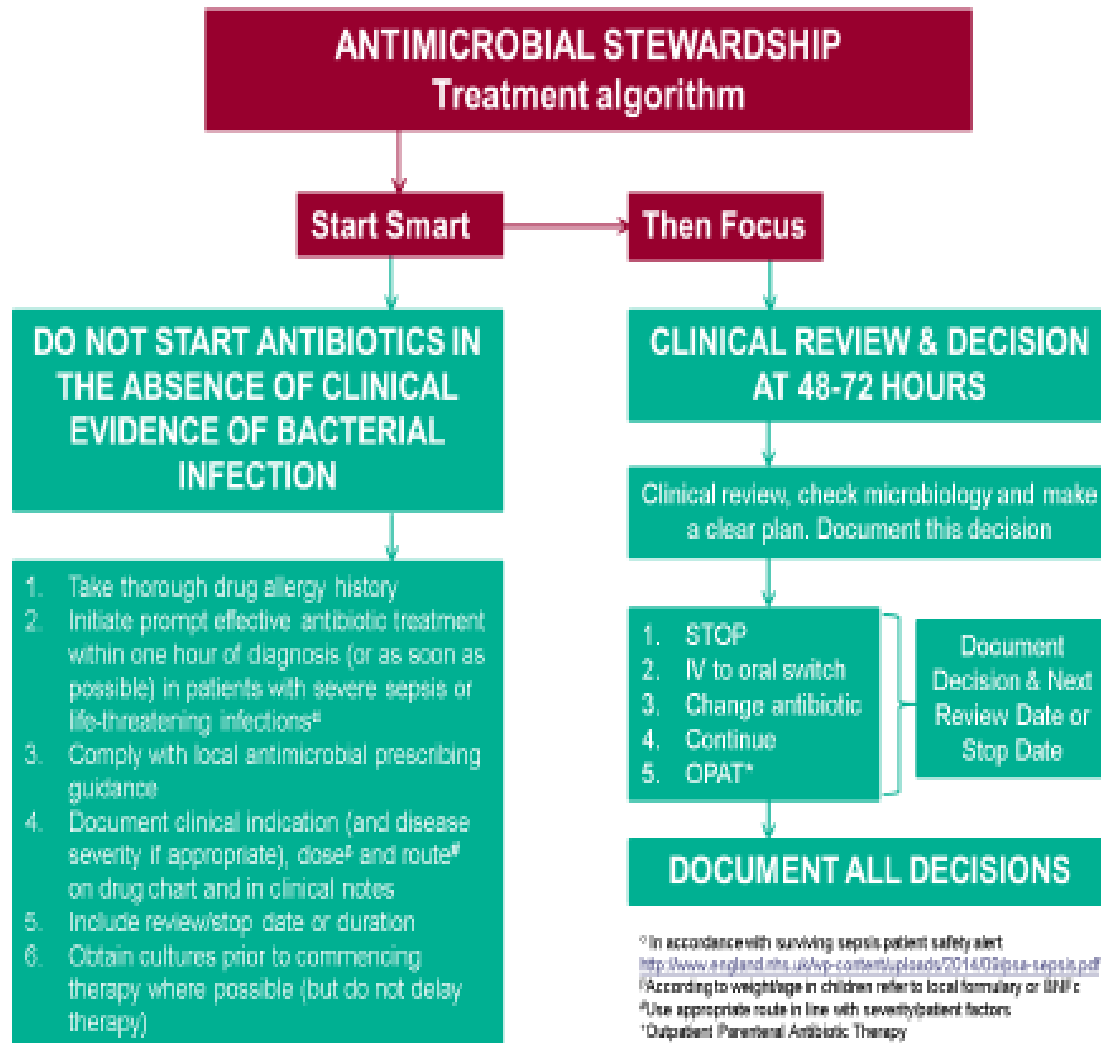
Antimicrobial			DATE	15/5	16/5	17/5	/	/	/	/	/	/	/	/	
Vancomycin			Circle or state time	Day 1	Day 2	Day 3 Sign for 72 hour review	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
Dose	APC	Route	IV	06											
Start Date			15/5	08											
Time prescribed			20:00												
Indication/Additional instructions			cellulitis	12											
Stop/Review Date			17/5	14											
Micro approved?			<input type="checkbox"/>	18											
Signature			AD	20											
Print Name			A. Doctor	22											
Pharmacist check	Source of Supply	If for infusion state:	Fluid	Volume (ml)			Rate (ml/hour)								

- The signature for administration should appear on the additional prescription chart

Vancomycin auto-prescription				Sherwood Forest Hospitals NHS NHS Foundation Trust	
Creatinine: 100 micromol/L Age: 50 years Weight: 50 kg Sex: f (m or f) Height if obese: cm Aiming for: <input checked="" type="radio"/> 10-15mg/L <input type="radio"/> 15-20mg/L	Name: Example Patient DOB: 01/01/50 D num: D012345 Patient ID sticker				
Calculated GFR: 47 mL/min <input type="checkbox"/> tick for glucose not saline <input type="checkbox"/> tick if on dialysis	Ward: X		Attach to the drug chart and write "vancomycin - see chart"		
Date	Time due	Dose & admin details		Time given	Nurse sigs
Loading dose					
15-May-18	20:08	1200mg	in 250ml sodium chloride 0.9% over 120 minutes (=125ml/hr)		
Maintenance doses					
16-May-18	8:00	750mg	in 250ml sodium chloride 0.9% over 90 minutes (=167ml/hr)		
16-May-18	20:00	750mg			
17-May-18	8:00	750mg			
*Take blood for vanc level just before maintenance dose 3: Time taken: _____ Sig: _____					
Doctor sig: AD		name: A. Doctor		(for loading dose and maintenance 1,2,3)	
Give dose after level taken. When result back... interpret level (see dose adjustment table) and prescribe 3 more doses				Vancomycin level result?: _____ mg/L	

Appendix B: The Department of Health Antimicrobial Stewardship treatment algorithm – Start smart then focus

Figure 1: Antimicrobial Stewardship (AMS) – Treatment algorithm



Appendix C: IV to PO Switch

Review IV antibiotics within 48-hrs

Does your patient have an infection that may require special consideration?

Infections that may require special consideration include: deep-seated infections, infections requiring high tissue concentration, infections requiring prolonged intravenous antimicrobial therapy or critical infections with high risk of mortality.

To note: on specialist advice, an IVOS within 48 hours may still be indicated for some patients with these infections.

Infections for special consideration include, but are not limited to, those listed below:

- | | | | |
|-------------------------|-----|--|-----|
| • bloodstream infection | Y/N | • osteomyelitis | Y/N |
| • empyema | Y/N | • severe or necrotising soft tissue infections | Y/N |
| • endocarditis | Y/N | • septic arthritis | Y/N |
| • meningitis | Y/N | • undrained abscess | Y/N |

If **YES** → check for clearly documented plan or seek specialist advice
 If **NO** → continue

1a. Enteral route

- 1.1. Is the patient's gastrointestinal tract functioning with no evidence of malabsorption? Y/N
 1.2. Is the patient's swallow or enteral tube administration safe? Y/N

If **NO** → reassess in 24 hours
 If **YES** → continue

1b. Enteral route continued

- 1.3. Are there any significant concerns over patient adherence to oral treatment? Y/N
 1.4. Has the patient vomited within the last 24 hours? Y/N

If **YES** → reassess in 24 hours
 If **NO** → continue

2. Clinical signs and symptoms

- 2.1. Are the patient's clinical signs and symptoms of infection improving? Y/N

If **YES** → continue
 If **NO** → reassess in 24 hours

3. Infection markers

- 3.1. Has the patient's temperature been between 36-38°C for the past 24 hours? Temp: Y/N
 3.2. Is the patient's Early Warning Score (EWS) decreasing? EWS: Y/N
 3.3. Is the patient's White Cell Count (WCC) trending towards the normal range?* WCC: Y/N
 3.4. Is the patient's C-Reactive Protein (CRP) decreasing?* CRP: Y/N

If **NO** → reassess in 24 hours
 If **YES** → prompt or assess for switch

PROMPT FOR SWITCH:

Nursing/pharmacy teams to prompt prescriber or infection specialist to consider IV to oral switch.

ASSESS FOR SWITCH:

Prescriber or infection specialist to consider IV to oral switch. Identify whether a suitable oral switch option is available, considering for example oral bioavailability, any clinically significant drug interactions, patient allergies or contra-indications.

* NB: these infection markers could also indicate inflammation or could be affected, for example, by steroid treatment. IV to PO switch may still be considered if they are the only markers not met

NB. Wherever possible, use positive culture results to guide therapy. Where there are NO positive cultures refer to the table below or the specific guideline for the infection being treated.

Recommended oral alternatives

IV	ORAL
Co-amoxiclav 1g tds	Co-amoxiclav 625mg tds
Amoxicillin 500mg-1g tds	Amoxicillin 500mg-1g tds
Flucloxacillin 1-2g qds	Flucloxacillin 1g qds
Clindamycin 600mg qds	Clindamycin 300-450mg qds (can use a maximum of 600mg qds if severe infection, N.B. unlicensed)
Piperacillin/Tazobactam 4.5g tds	Choice of oral antibiotic depends on microbiology sensitivities. For oral choice if negative cultures, refer to the specific guideline for the infection being treated.
Cefuroxime 1.5g tds + / - Metronidazole 500mg tds	
Meropenem 1g tds	
Vancomycin / Teicoplanin	

Appendix D

Antibiotics in Penicillin Allergy

All medication allergies **MUST** be documented on drug charts, along with the type of reaction
Consult the antibiotic guidelines on the SFHT intranet for any further information. Note: This is not a comprehensive list

SEVERE PENICILLIN ALLERGY

Within 72 hours;

Anaphylaxis
Urticaria—itchy rash
even after 72 hours
Hives
Laryngeal oedema
Bronchospasm
Hypotension

NON-SEVERE PENICILLIN ALLERGY

After 72 hours;

Minor non-itchy rash restricted to a small area of the body

INTOLERANCE: GI Upset inc vomiting, nausea, diarrhoea

**Contra
Indicated**

IN PATIENTS WITH
SEVERE AND NON-
SEVERE PENICILLIN
ALLERGY

Caution

USE WITH CAUTION IN
NON-SEVERE AND
AVOID IN SEVERE
PENICILLIN ALLERGY

**Considered
Safe**

Amoxicillin
Benzylpenicillin
Co-amoxiclav (Augmentin®)
Flucloxacillin
Penicillin V (Phenoxymethylpenicillin)
Piperacillin/Tazobactam (Tazocin®)
Pivmecillinam
Temocillin

Cephalosporins

Cefalexin
Cefixime
Cefotaxime
Cefuroxime
Ceftazidime
Ceftriaxone

Other beta-lactam

Ertapenem
Meropenem—May be used
in severe penicillin allergy after
desensitization (on consultant
microbiologist advice only)
Aztreonam—May be
used with caution in severe
penicillin allergy

Amikacin
Azithromycin
Chloramphenicol
Ciprofloxacin
Clarithromycin
Clindamycin
Colistin
Co-trimoxazole
Daptomycin
Doxycycline
Erythromycin
Fosfomycin
Gentamicin

Levofloxacin
Linezolid
Metronidazole
Nitrofurantoin
Ofloxacin
Rifampicin
Sodium fusidate
Teicoplanin
Tetracycline
Tigecycline
Tobramycin
Trimethoprim
Vancomycin

In cases of **INTOLERANCE** to penicillins (e.g. gastrointestinal upset), penicillin related antibiotics should not be withheld unnecessarily in severe infection but the patient must be monitored closely after administration.

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Approved by: APWG
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Appendix E – Restricted antimicrobials list and procedure for obtaining microbiology approval

Before prescribing a restricted antimicrobial the prescriber should first consider all other antimicrobial options (in line with SFH Antimicrobial Guidelines) and prescribe alternative agent(s) whenever possible.

If the required use of the restricted antimicrobial falls within the exception criteria (as listed below), the agent may be prescribed. The prescription must be endorsed with the approved clinical indication.

If the prescriber considers that there is no alternative therapy to the restricted antimicrobial and no exception criterion applies:

During weekday working hours (09.00 to 17.00 Monday to Friday)

- The prescriber must contact a Microbiologist to discuss the patient and seek approval
- The prescriber must be of adequate seniority to undertake an informed clinical discussion and wherever possible, the case should have been discussed with the patient's consultant

Out-of-hours (After 17:00 Monday to Friday, Saturday, Sunday and Bank Holidays)

- Pharmacy may supply minimum required doses of a restricted antimicrobial without microbiologist approval.
- This allows therapy to continue until the following day, when the patient must be reviewed by their own team and the case discussed with a Microbiologist

Restricted Agent	Exception criteria / Approved Clinical indications ALL other indications require <u>documented</u> Medical Microbiologist approval
<u>Ambisome</u> [®] (LIPOSOMAL amphotericin)	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist or Haematologist only
<u>Amikacin</u> IV	<ul style="list-style-type: none"> • Cystic fibrosis in children (Paediatric consultant approval) • Otherwise approval by Consultant Medical Microbiologist only
<u>Aztreonam</u>	<ul style="list-style-type: none"> • Severe HAP incl. aspirational HAP if severe penicillin allergy or allergic to cephalosporins and failed (or resistant to) levofloxacin • Obstetric infections in patients with severe penicillin allergy • Cystic fibrosis • Otherwise approval by Consultant Medical Microbiologist
<u>Anidulafungin</u>	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist only
<u>Caspofungin</u>	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist only. For use in haematology/oncology patients only – use Anidulafungin for other patient groups
<u>Cefazolin</u>	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist only
<u>Ceftazidime/Avibactam</u> (Zavicefta [®])	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist only
<u>Chloramphenicol</u> IV/PO	<ul style="list-style-type: none"> • Bacterial meningitis for patients <60 years of age and severe penicillin allergy or allergy to cephalosporins • Otherwise approval by Consultant Medical Microbiologist
<u>Dalbavancin</u>	<ul style="list-style-type: none"> • Approval by Consultant Medical Microbiologist only

<u>Daptomycin</u>	<ul style="list-style-type: none"> Approval by Consultant Medical Microbiologist only
<u>Ertapenem</u>	<ul style="list-style-type: none"> Approval by Consultant Medical Microbiologist only. For use in OPAT / SDEC (Meropenem – 1st line carbapenem for inpatients)
<u>Fosfomycin IV</u>	<ul style="list-style-type: none"> Approval by Consultant Medical Microbiologist only
Ganciclovir	<ul style="list-style-type: none"> Consultant approval for haematology patients only
Imipenem–cilastatin	<ul style="list-style-type: none"> MDR-TB
Isavuconazole	<ul style="list-style-type: none"> Approval by Consultant Medical Microbiologist or Haematology consultant
<u>Moxifloxacin</u>	<ul style="list-style-type: none"> multi-resistant TB or where other first line TB treatments are considered inappropriate by ID/Respiratory Consultant Microbiology advice
<u>Ofloxacin</u>	<ul style="list-style-type: none"> 2nd line agent for treatment of Pelvic inflammatory disease or other sexually transmitted infections (GUMed) IV on microbiology advice only
<u>Rifampicin</u>	<ul style="list-style-type: none"> Combination therapy in TB and leprosy treatment. Post-exposure prophylaxis for Meningococcal and <i>Haemophilus influenzae B</i> infections. Treatment of serious Staphylococcal infections (eg. Endocarditis, epidural abscess). <p><i>NB Rifampicin <u>should not</u> be used as a single agent (except in meningitis post-exposure prophylaxis)</i></p>
<u>Temocillin</u>	<ul style="list-style-type: none"> Approved by consultant medical microbiologist only
<u>Tigecycline</u>	<ul style="list-style-type: none"> Approval by Consultant Medical Microbiologist only
<u>Tobramycin IV</u>	<ul style="list-style-type: none"> Cystic fibrosis
<u>Voriconazole</u>	<ul style="list-style-type: none"> Treatment of Aspergillosis (Respiratory consultant) Otherwise approval by Consultant Medical Microbiologist or Haematologist

APPENDIX F - Methods of IV administration of commonly used antibiotics in adults

For antimicrobials not listed in the table below, please refer to the [Medusa](#) guide via Trust Intranet

Antibiotic	Option 1 (bolus)	Option 2 (infusion)	High-risk patients: <ul style="list-style-type: none"> critically ill or if high MIC* as per microbiology
Amoxicillin	Bolus 3-5min [C]	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS [C]	Option 2 preferred
Aztreonam	Bolus 3-5min	Gravity/pump infusion (100ml NS over 30-60min) and flush* giving set with 25ml NS OPAT – elastomeric pumps available	Option 1 or 2
Benzylpenicillin	Bolus doses ≤ 1.2g over 5min; doses >1.2g, max rate 300mg/minute	Gravity/pump infusion (100ml NS over 30-60min) and flush* giving set with 25ml NS	Option 1 or 2
Ceftazidime	Bolus doses ≤ 2g over 3-5min	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS. OPAT – elastomeric pumps available; can bolus 3g doses as well	Option 1 or 2
Ceftriaxone	Bolus doses ≤ 2g over 5min	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS	Option 2 preferred
Cefuroxime	Bolus 3-5min	Gravity/pump infusion (50-100ml NS over 30-60min) and flush* giving set with 25ml NS	Option 1 or 2
Chloramphenicol	Bolus 3-5min	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS	Option 1 or 2
Ciprofloxacin	N/A	Gravity/pump infusion (400mg over 60min) and flush* giving set with 25ml NS [C]	Option 2 only
Clindamycin	N/A	Infusion, preferably using a pump (volume and duration depending on dose) and flush* giving set with 25ml NS. If pump not available can use gravity infusion	Option 2 only
Co-amoxiclav	Bolus 3-5min [C]	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS [C]	Option 1 or 2
Daptomycin	IV bolus min 2 min [C]	Gravity/pump infusion and flush* giving set with 25ml NS [C]	Option 1 or 2
Flucloxacillin	Bolus doses 1g (or less) over 3-4 min and doses of 2g over at least 8 min	Gravity/pump infusion ((100ml NS or G over 30min) and flush* giving set with 25ml NS	Option 1 or 2
Fosfomycin	N/A	Infuse using pump (volume and duration depending on dose; dilute with G) and flush* the giving set with 25ml G or NS	Option 2 only

Antibiotic	Option 1 (bolus)	Option 2 (infusion)	High-risk patients: <ul style="list-style-type: none"> critically ill or if high MIC* as per microbiology
Gentamicin	Local practice up to 80mg IV bolus [C]	For once daily regimen - infuse using pump (100ml NS over 60min and flush* giving set with 25ml of NS [C])	Depending on regimen - Option 2 for Once daily dosing
Levofloxacin	N/A	Infusion using a pump (250mg over 30min; 500mg over 60min; 750mg (unlicensed dose) over 90 min.) and flush* giving set with 25ml NS [C]	Option 2 only
Meropenem	Bolus doses up to and including 1g	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS	Option 2 preferred or Extended Infusion (see separate guidance)
Metronidazole	N/A	Gravity/pump infusion (ready diluted over 30-60min) and flush* giving set with 25ml NS	Option 2 only
Tazocin (Piperacillin/ Tazobactam)	N/A	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml on NS OPAT – elastomeric pumps available	Option 2 or Extended Infusion (see separate guidance)
Teicoplanin	Bolus up to 800mg	Gravity/pump infusion (100ml NS over 30min) and flush* giving set with 25ml NS	Option 1 or 2 depending on dose
Vancomycin	N/A	Infusion using a pump (volume and duration depending on Trust protocol) and flush* giving set with 25ml NS [C]	Option 2 or Continuous Infusion (see separate guidance)

*Flush the set at the same speed as the same speed as the main infusion

[C] – Administration via central route is preferable. If a central venous access device is unavailable, administer via a large peripheral vein, monitoring closely, and resite cannula at first signs of inflammation.

G – Glucose 5%

MIC – Minimum Inhibitory Concentration

NS – 0.9% Sodium Chloride

NB: Alternative infusion fluids and volumes may be acceptable in certain circumstances (i.e. fluid restriction) – check [Medusa](#) or contact pharmacy

Last updated: June 2021

APPENDIX G - EQUALITY IMPACT ASSESSMENT FORM (EQIA)

Name of service/policy/procedure being reviewed: Antimicrobial Prescribing Policy			
New or existing service/policy/procedure: Existing			
Date of Assessment: 01/06/23			
For the service/policy/procedure and its implementation answer the questions a – c below against each characteristic (if relevant consider breaking the policy or implementation down into areas)			
Protected Characteristic	a) Using data and supporting information, what issues, needs or barriers could the protected characteristic groups' experience? For example, are there any known health inequality or access issues to consider?	b) What is already in place in the policy or its implementation to address any inequalities or barriers to access including under representation at clinics, screening?	c) Please state any barriers that still need to be addressed and any proposed actions to eliminate inequality
The area of policy or its implementation being assessed:			
Race and Ethnicity	No issues, needs or barriers	N/A	N/A
Gender	No issues, needs or barriers	N/A	N/A
Age	No issues, needs or barriers	N/A	N/A
Religion	No issues, needs or barriers	N/A	N/A
Disability	No issues, needs or barriers	N/A	N/A
Sexuality	No issues, needs or barriers	N/A	N/A
Pregnancy and Maternity	No issues, needs or barriers	N/A	N/A
Gender Reassignment	No issues, needs or barriers	N/A	N/A
Marriage and Civil Partnership	No issues, needs or barriers	N/A	N/A
Socio-Economic Factors (i.e. living in a poorer neighbourhood / social deprivation)	No issues, needs or barriers	N/A	N/A
What consultation with protected characteristic groups including patient groups have you carried out?			
<ul style="list-style-type: none"> • N/A 			

What data or information did you use in support of this EqlA?

- N/A

As far as you are aware are there any Human Rights issues be taken into account such as arising from surveys, questionnaires, comments, concerns, complaints or compliments?

- No

Level of impact

Low Level of Impact

Name of Responsible Person undertaking this assessment: Desislava Milanova

Signature: Desi Milanova

Date: 01/06/23