

Antimicrobial Stewardship Policy

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* All procedures must be reviewed every three years. A director may decide to set a shorter review period, if appropriate/required. There may also be a need to review a procedure in advance of a planned review date, i.e. due to changes in national policy or legislation, changes in service provision, recommendation from internal or external review, change in local and national reporting requirement or targets.

Services	Trustwide NHS ELFT
Trustwide	Yes
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Primary Care	Yes

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1. Introduction

1.1 Purpose

This Policy defines the Trust processes to ensure that prescribing, monitoring and improving the quality of antimicrobial prescribing and usage is safe and effective. This Policy provides a framework for antimicrobial stewardship within the Trust.

Implementation of this Policy will contribute to:

- The safe, effective and appropriate use of antimicrobial agents within the Trust by following evidence-based prescribing guidance
- Quality improvement for the safe, appropriate and prudent prescribing of antimicrobial agents, thereby optimising patient outcomes
- Ensuring the effective monitoring and evaluation of antimicrobial prescribing and use within the Trust
- Raising awareness of antimicrobial resistance amongst ELFT staff, patients and service users.
- Conserve and steward the effectiveness of antimicrobial agents by contributing to minimising the development of antimicrobial resistance
- Reducing the risk of multi-resistant infections (see Prevention and Management of Multi Drug Resistant Gram-Negative bacteria Policy)

This Policy also ensures Trust compliance with the requirements of national strategy and guidance (see section 10).

The Policy should be read in conjunction with the ELFT Medicines Policy and Infection Prevention and Control guidance (see section 8).

This policy applies to all employees of the Trust who prescribe, administer or monitor antimicrobial prescriptions.

2. Duties and Responsibilities

Improving antimicrobial prescribing and stewardship is dependent on strong clinical leadership. Senior health professionals including consultants should take a leadership role in promoting antimicrobial stewardship and for antimicrobial quality improvement in their specialist areas.

All health and social care staff directly involved in the care of patients receiving antimicrobial treatment are responsible for making themselves familiar with the Trust Policy and for adhering to the Policy recommendations. Reasons for departure from policy recommendations should be documented in the patient medical record and specialist advice sought where necessary.

All health and social care staff have a responsibility to manage the general public's expectations around antimicrobials and encourage changes in behaviour to help reduce antimicrobial resistance and stop the spread of resistant microbes.

The Trust Antimicrobial Stewardship Group (AMSG) oversees the development and implementation of the organisations Antimicrobial Stewardship Program.

See *Appendix A*: for the antimicrobial stewardship responsibilities of each staff group.

3. Definitions Used

For an explanation of the terms used in the Policy see *Appendix B*.

4. General Principles of Antimicrobial Prescribing

When considering prescribing an antimicrobial, the following is recommended:

- Before prescribing any medication it is important that allergies are identified and documented on the prescription chart along with the reaction – see section 4.4
- **No** prescribing of antibiotics for simple coughs and colds
- **No** prescribing of antibiotics for sore throats (other than true group A Streptococcal infection)
- **Prescribe** according to local antimicrobial guidelines – see section 4.1 and Appendix C
- **Manage** patient expectations of an antimicrobial prescription for self-limiting infections, using the following strategies:
 - **Do not offer a prescription** for acute, self-limiting infections, where antibiotics are not indicated and self-management is appropriate. Reassure the patient of the likely self-limiting viral diagnosis and provide general symptomatic advice.
 - **Offer a ‘delayed prescription’** when the need for an antimicrobial is doubtful, together with advice about when the prescription should be used (if symptoms do not settle or get significantly worse; re-consulting if symptoms get significantly worse despite using the delayed prescription).
 - **Take time to explain** to patients that it is inappropriate to prescribe an antimicrobial for a self-limiting viral infection; this advice will reduce future similar consultations.

Topical dermatological antimicrobials should only be prescribed in accordance with local or national evidence based guidelines where appropriate after seeking specialist advice. Topical antimicrobials should only be used for localised infections (e.g. head lice, ear or eye infections).

Patients admitted on antimicrobials; the antimicrobial should be prescribed as per the recommendations of the initiating prescriber. The prescription should have a clearly specified course length and indication stated. Where this is not evident from the transfer letter/prescription every effort should be made to contact the initiating prescriber to establish the intended duration/indication.

Prophylactic antimicrobials: Where the prescription is for prophylaxis, “for prophylaxis” should be written / added in the additional instructions box on the prescription chart.

Repeat prescriptions: Do not offer repeat prescriptions for antimicrobials unless needed for a particular clinical indication. Avoid issuing repeat prescriptions for longer than 6 months without review and ensure adequate monitoring for individual patients to reduce adverse drug reactions and to check whether continuing an antimicrobial is necessary.

Healthcare Acquired Infections (HCAI): For advice on the management and treatment of HCAs please refer to local antimicrobial guidelines and relevant ELFT IPC Policies.

4.1 Antimicrobial Guidelines and Resources

The UK Health Security Agency (UKHSA) Management of infection guidance for primary care is used across the majority of ELFT services on the recommendation of the ELFT AMSG.

ELFT services are associated with various partner organisations (Acute Hospital Trusts and Clinical Commissioning Groups (CCGs)) in certain areas and follow their antimicrobial treatment guidelines and formularies in these areas.

Appendix C lists the antimicrobial guidelines to be followed per site.

4.2 Start Smart, Then Focus

This procedure is also described by the flow chart in Appendix D

START SMART:

- **Antimicrobials should only be prescribed if clinically indicated**, where there is likely to be clear clinical benefit, according to the patient's clinical signs and symptoms of infection and/or sepsis. Do not start antimicrobials in the absence of clinical evidence of infection or on a 'just in case' basis
 - When prescribing an antimicrobial, undertake a clinical assessment and document the clinical diagnosis (including symptoms) in the patient's medical record and clinical management plan.
 - For patients with non-severe infections, consider taking microbiological samples before making a decision about prescribing an antimicrobial, providing it is safe to withhold treatment until the results are available.

- **Ensure appropriate microbiological cultures and specimens have been taken prior to starting antimicrobial therapy where possible, but do not delay therapy.** Review all relevant microbiology results in a timely manner.
 - Appropriate sampling. These should be good specimens, e.g. a sample of pus rather than a swab, purulent sputum rather than saliva. Labelled specimens should be sent to the laboratory in appropriate transport media.
 - For patients with suspected infections, take microbiological samples before prescribing an antimicrobial and review the prescription when the results are available.
 - For patients with recurrent or persistent infections, consider taking microbiological samples when prescribing an antimicrobial and review the prescription when the results are available.
 - Refer to local microbiology service, if there are any queries.

- **Prescribers must follow the relevant local (where available) or national antimicrobial treatment guidelines for the treatment of infection or the British National Formulary (BNF) where guidelines do not exist.**

- Individual patient factors and medicine-specific factors to be taken into account when deciding which antimicrobial agent to prescribe:
 - Renal or hepatic impairment
 - Previous antimicrobial history
 - Previous HCAs or known colonisation
 - Previous infection with multi-resistant organisms
 - Drug interactions, allergies or intolerance
 - Availability of and absorption by oral route
 - Pregnancy or lactation
 - Immunosuppression
 - Co-morbidity

- Prescribers are reminded to consider the risk of resistant microorganisms such as MRSA, ESBL-producing organisms, CPE, GRE/VRE and offer alternative treatment regimens accordingly or seek expert advice.
- Narrow-spectrum antimicrobial agents should be used in preference to broad-spectrum agents wherever possible and must be in line with national guidance or local antimicrobial guideline where available
- Broad spectrum antibiotics such as co-amoxiclav, cephalosporin (e.g. Cefalexin), Carbapenems (e.g. Meropenem), quinolones (e.g. Ciprofloxacin) and Piperacillin with Tazobactam increase the risk of Clostridium difficile, MRSA, ESBLs, VRE/GRE and resistant urinary tract infections; using broad spectrum antibiotics must be carefully considered
- Prescribers are reminded to use an antimicrobial agent with an adequate spectrum to cover only the expected microorganisms for less severe infections. Broad-spectrum antimicrobials are sometimes not as potent in vitro as narrow-spectrum antimicrobials against certain microbes.

- **Sepsis: Urgent need to start treatment with effective antimicrobial agents for severe sepsis or life-threatening infections**
 - See NICE guidelines on sepsis
<https://www.nice.org.uk/guidance/ng51>

- **Initiate prompt effective antimicrobial treatment.** Give the first dose of antimicrobial within 1 hour of diagnosis for severe or life-threatening infections. **Antimicrobial therapy should never be delayed in an emergency**

- **Use the oral route in preference to the IV route**

- **IV administration should only be considered for patients who are severely ill, unable to tolerate oral treatment, or where oral therapy would not provide adequate coverage or tissue penetration.** See section 4.6 and *Appendix G*

- **Document the exact clinical indication on the prescription chart and in the patient medical record (RIO).** Inclusion in both may clarify the patient treatment pathway thus aiding in the improvement of patient outcomes and in medico-legal outcomes such as for c. difficile apportionment.

- **Document the duration of therapy (course length/review date) on the prescription chart and in the patient medical record (RIO).** Following local

(where available) or national antimicrobial guidelines the shortest effective course length should be prescribed.

- This ensures an appropriate clinical outcome for the patient while minimising the risk of adverse effects and antimicrobial resistance.
- Prescription duration should be explicitly specified by the prescriber in the patient medical record and on the prescription chart.
- The prescription will be dispensed for the indicated duration only.
- The antimicrobial course length for uncomplicated urinary tract infections should be no more than 3 days for females and 7 days for males.

THEN FOCUS:

- **At 48 – 72 hours review clinical diagnosis and continuing need for antimicrobials, and document clear plan of action in the patient medical record.**
 - STOP antimicrobial if there is no evidence of infection
 - SWITCH antimicrobials from intravenous to oral route (See *Appendix G*)
 - CHANGE broad-spectrum antibiotics to narrow spectrum agents where appropriate
 - CONTINUE and document next review or stop date
 - Outpatient Parenteral Antibiotic Therapy (OPAT)
- Review microbiology results daily and de-escalate to microorganism-directed narrow-spectrum treatment promptly where appropriate
- It is essential that the review and subsequent decision is clearly documented in the patient medical record and on the prescription chart where possible.

Expert medical microbiologist advice must be sought for: complicated infections, interpretation of culture and sensitivity results, or in the case of empirical treatment failure, including the suspicion/confirmation of MRSA, ESBL producing organisms, VRE/GRE and *Clostridium difficile* infection.

Restricted antimicrobials should only be prescribed following consultation with a microbiologist unless it forms part of an approved clinical guideline or sensitivity reports. The decision to treat with one of these agents should be clearly documented within the patient's medical record and on the prescription chart. If this information is not evident the pharmacist should contact the prescriber for verification of the choice of antimicrobial

Non-formulary antimicrobial prescribing should only take place after advice and agreement has been sought from the local microbiology service.

4.3 Documentation in Patient Medical Records (RIO) and prescription chart

When an antimicrobial agent is a treatment option, document in the patient's medical record:

- The reason for prescribing, or not prescribing an antimicrobial. **Minimum level of information to be recorded includes: indication, antimicrobial choice and intended duration/review date** - this should be explicitly stated in both the patient's medical record (RIO) **and** the prescription chart.
- The plan of care as discussed with the patient, their family member or carer (as appropriate). Including the planned duration of any treatment.

- When prescribing is outside local (where available) or national guidelines, document in the patient's records the reason for the decision.

4.4 Hypersensitivity Reactions and Allergy Status

A history of allergy to the relevant antimicrobial agent should always be sought. Before prescribing any medication it is important allergies are identified and documented on the prescription chart along with the reaction.

It is unacceptable to leave the allergy status section blank. If the patient has no known allergies or sensitivities then 'no known allergies' or NKDA must be documented accordingly.

In some cases there will be an overlap between medication allergy and medicine intolerance. The medicine and reaction needs to be recorded on the patient's prescription chart, as well as in their medical record.

Patients with a history of anaphylaxis, urticarial rash or a rash immediately after penicillin administration should not receive penicillin, cephalosporin or other beta-lactam antibiotics (e.g. Augmentin®, co-amoxiclav). If in doubt, discuss alternatives to beta-lactams with a medical microbiologist.

Patients with a history of allergies should be assessed and the allergy label removed where it is not correct, in order to improve patient outcomes. This information should be communicated with the patients GP to allow update of primary care records.

Further information on hypersensitivity reactions and allergy status can be found in *Appendix E* and the ELFT Treatment of Anaphylaxis Guideline. Please see *Appendix F* for more information on Penicillin Allergies.

4.5 Advise for Patients and / or Family or Carers

Health and social care professionals should take time to discuss the following with the patient and/or their family members or carers (as appropriate):

- **The likely nature of the condition**, including the average total length of the illness (before and after seeing the prescriber)
- **Why prescribing an antimicrobial may not be the best option** – give reassurance that antibiotics are not needed immediately because they are likely to make little difference to symptoms and may have side effects, for example, diarrhoea, vomiting and rash.
- **Alternative options to prescribing an antimicrobial** e.g. advice about managing symptoms including fever with analgesics and antipyretics
- **Their views on antimicrobials**, taking into account their priorities or concerns for their current illness and whether they want or expect an antimicrobial
- **The benefits and harms of immediate antimicrobial prescribing**
- **General advice on appropriate antimicrobial use** – Take exactly as prescribed, do not share with others or save for later
- **What they should do if their condition deteriorates** or if they have problems as a result of treatment
- **Whether they need any written information** about their medicines and any possible outcomes.

Further information on NICE antimicrobial stewardship guidance for the public can be found here: <https://www.nice.org.uk/guidance/ng15/resources/using-antimicrobial-medicines-safely-and-wisely-to-treat-infections-327009432517>

4.6 Intravenous (IV) Therapy

IV antimicrobial therapy should not be administered by ELFT Registered Mental Health Nurses (RMNs) but may be given by doctors who are familiar and competent.

Admission to an acute hospital should be considered if IV therapy is warranted but no suitably familiar and competent staff are available for administration.

Within community health services, IV antimicrobial therapy can be prescribed where there is a service agreement to do so. This may include bedded and community settings such as via Outpatient Parenteral Antimicrobial Therapy Services (OPAT) / Ambulatory Care) or in specific locally agreed services.

The IV route should only be used when recommended by treatment guidelines, microbiology advice or when other routes are not available.

The IV route should be reserved for patients where the severity of the infection requires IV therapy, unable to tolerate oral treatment, oral antimicrobial therapy has failed, or where oral therapy would not provide adequate coverage or tissue penetration. In this case clinicians should seek advice from the treatment guidelines or microbiology.

Patients who are confused or have previous history of intravenous drug abuse are excluded from community OPAT consideration (until assessed by the OPAT nurse and deemed suitable).

Many moderate to severe infections can be successfully treated with oral antimicrobials, and some agents (e.g. metronidazole, clindamycin or ciprofloxacin) have excellent bioavailability making oral dosing just as effective as IV therapy.

Further information on IV to oral switch of antimicrobials can be found in *Appendix G*.

4.7 Antimicrobials at Discharge

When a patient is being discharged or their care is being transferred to another care setting the following information should be included in the discharge summary/letter:

- Information about current and/or recent antimicrobial use, including indication, antimicrobial prescribed, dosage, course length and any adverse reaction (if applicable).
- Information about when a current antimicrobial course should be reviewed
- Information about who the patient should contact where appropriate, and when, if they have concerns about infection
- Details of any resistant organisms identified
- Details of any HCAI and treatment given

4.8 Notifiable Diseases

Under the Health Protection (Notification) Regulations 2010, physicians are required to notify the Consultant in Communicable Disease Control if they diagnose certain diseases. Please refer to the UKHSA guidance on how to report notifiable diseases and the list of diseases: <https://www.gov.uk/guidance/notifiable-diseases-and-causative-organisms-how-to-report>

5 Education and Training

All Trust staff (clinical and non-clinical) receive a short introductory session on antimicrobial resistance and stewardship as part of IPC mandatory training.

Training for prescribers, pharmacists and nursing staff is available via the Health Education England e-Learning package entitled Reducing Antimicrobial Resistance available via <http://www.e-lfh.org.uk/programmes/antimicrobial-resistance/>

6 Approval and ratification

The Trusts Medicines Committee and IPC Committee (IPCC) are responsible for the approval and ratification of this Antimicrobial Stewardship Policy.

7 Monitoring Compliance and Effectiveness

Adherence to the Policy is monitored by the Antimicrobial Stewardship Group.

Monitoring of antimicrobial prescribing is undertaken on a quarterly basis as part of the ELFT antimicrobial prescribing audit. Results of these audits are reported quarterly to the IPCC and AMMSG and disseminated to the relevant divisional services. Feedback is provided to individual prescribers and teams where possible. An audit summary is also presented to the Trust board annually. Antimicrobial consumption for all services trust-wide is monitored via the AMMSG.

8 Policies to which this relates

This document should be read in conjunction with the following Trust documents:

- Infection Prevention and Control Policies and Procedures
- Treatment of Anaphylaxis Guideline
- Medicines Policy
- Antimicrobial Stewardship Strategy
- Respective Antimicrobial treatment guidelines for service (see Appendix C)

9 Consultation

In the development of this policy the following have been consulted:

Medical Consultant Microbiologist, IPCC Members, Trust Chief Pharmacist, Deputy Chief Pharmacists, Trust Lead Pharmacists, Medicines Committee, Medical Director, Lead Pharmacist Vaccinations and Antimicrobial.

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Appendices

Appendix A – Antimicrobial Stewardship Responsibilities of each staff group

Individual/ Group	Are responsible for:
Antimicrobial Stewardship Group (AMSG)	<ul style="list-style-type: none"> • Ensure that evidence-based local antimicrobial guidelines are in place and reviewed regularly or when new evidence is published • Ensure regular auditing of the guidelines, antimicrobial stewardship practice and quality assurance measures • Identify actions to address non-compliance with local guidelines, general antimicrobial stewardship issues and other prescribing issues • Review prescribing and resistance data and identify ways of feeding this information back to prescribers in all care settings • Work with prescribers to explore the reasons for very high, increasing or very low volumes of antimicrobial prescribing, or use antimicrobials not recommended in local (where available) or national guidelines • Provide feedback and advice to prescribers who prescribe antimicrobials outside of local guidelines when it is not justified • Report a regular formal review of the organisation’s retrospective antibiotic consumption data (especially highlighting the use of broad-spectrum antibiotics such as cephalosporins, co-amoxiclav, piperacillin with tazobactam, fluoroquinolones and carbapenems) • Promote education for prescribers and all health and social care staff in all care settings • Assist local formulary decision-making groups with recommendations about new antimicrobials • To identify specific research areas relating to antimicrobial use • To review medication incidents reported within ELFT that relate to antimicrobials and implement necessary action points • To promote quality and cost effective use of antimicrobial drugs
Medical and Non-Medical Prescribers (NMP)	<ul style="list-style-type: none"> • Accurate and appropriate prescribing according to this policy and PHE Antimicrobial Prescribing and Stewardship Competencies • Prescribing in line with relevant locally used antimicrobial guidelines, unless there are justified clinical reasons not to do so. Every effort should be made to discuss any such deviations with microbiology and the reason for the deviation and the names of those consulted should be recorded in the patients’ medical record • All patients must be asked about medication allergies. It is the prescriber’s responsibility to check the patients’ medication allergies/sensitivities status prior to prescribing. If a patient reports

	<p>an allergy to an antimicrobial agent it is necessary to clarify whether this is a true allergy or medicine intolerance. The prescriber should check which class an antibiotic belongs to before prescribing antimicrobial therapy in a patient with a known antimicrobial allergy to ensure appropriateness</p> <ul style="list-style-type: none"> • Record the clinical indication and antimicrobial course length and any relevant microbiology results in the patients' medical record (RIO). The indication and course length for the antimicrobial should also be stated on the prescription chart • Prescribers must specify duration of therapy, in accordance with local guidelines, or review date on the prescription chart and the patient medical record. This review date should not be more than 48 to 72 hours after starting the antimicrobial, if administered by the intravenous route • All doses of any antimicrobial must be prescribed on the prescription chart. If the timing of the first dose is clinically important, then the prescription should be written to ensure that there is no delay in the patient receiving the antimicrobial agent, either by writing the first dose in the 'once only drugs' section, or by careful timing of the administration of the medicine in the 'regular medicines' section of the prescription chart • It is the prescriber's responsibility to ensure that all antimicrobial prescriptions are reviewed regularly, particularly before the weekend, and rewritten if required • Consultants and senior prescribers should promote antimicrobial stewardship and take a leadership role in antimicrobial quality improvement in their specialist areas
Healthcare staff (including nursing staff)	<ul style="list-style-type: none"> • Healthcare staff are responsible for the safe administration of antimicrobial agents • Antimicrobial prescriptions in the 'once only medicines' section should be administered promptly • Check the patient is not allergic to the antimicrobial prescribed prior to administration. In cases where the patient has been prescribed an antimicrobial that he/she is known to be allergic to, the dose should not be administered and the prescriber should be contacted to clarify the prescription • Highlight to prescribers when antimicrobial durations are exceeded and the prescription needs further intervention to comply with this policy • Assess patient response and request the prescriber to review IV prescriptions 48 to 72 hours after initiation • Antimicrobial therapy must not be withheld if the documented

	<p>review date has passed without a prescribers review. Healthcare staff should contact the prescriber to review the prescription</p> <ul style="list-style-type: none"> • Doses of antimicrobials should ideally not be omitted. Antimicrobials are critical medicines and omitted doses can cause serious harm. If the medicines are not available, the nursing staff should make every reasonable effort to contact the pharmacist or the on-call pharmacist. If a dose is omitted, it must be recorded on the prescription chart • Adverse reactions to an antimicrobial should be reported to the prescribing team and further action on administration confirmed.
Pharmacists and Pharmacy Staff	<ul style="list-style-type: none"> • Are responsible for helping to promote awareness and adherence to the Policy and report any non-adherence • Promote safe antimicrobial prescribing • Should help ensure prescribers are aware of the relevant local antimicrobial treatment guidelines and confirm prescribing is in accordance with these documents where appropriate • Managing the safe, effective and economic use of medicines in the Trust. This process includes regular monitoring of prescriptions to ensure appropriateness, accuracy, safety and clarity of antimicrobial prescribing • As part of the prescription monitoring process pharmacists are responsible for: <ul style="list-style-type: none"> ➢ Ensure all antimicrobial prescriptions have indication, duration of therapy or review date specified on RIO. If these are not specified, every reasonable effort should be made to contact the prescriber and verbal agreement reached as to the appropriate indication, duration or review period. The prescription chart should be clearly annotated with the indication and the agreed duration or review period ➢ Ensure that antimicrobial prescriptions are prescribed for the shortest effective course length in accordance and local guidelines (where available) ➢ Check the patient is not allergic to the antimicrobial prescribed prior to dispensing. In cases where the patient has been prescribed an antimicrobial that he/she is known to be allergic to, the dose should not be dispensed and the prescriber should be contacted to clarify the prescription ➢ Where long term prophylaxis is indicated, the pharmacist should endorse the prescription chart as such if not already documented by the prescriber • Advise the prescriber regarding antimicrobials with good oral bioavailability that are prescribed intravenously, to ensure they are switched to the oral route as soon as it is clinically appropriate to do so • Review all requests for restricted antimicrobials to ensure

	<p>microbiology approval before placing an order or release of the product from pharmacy</p> <ul style="list-style-type: none"> • Challenge any inappropriate prescribing of antimicrobials, such as prescribing where there is no clear indication of infection, inappropriate combination therapy and use of restricted antimicrobials. Any on-going breaches of policy should be reported to the Lead Pharmacist for Vaccinations and Antimicrobials and the Microbiologist • Educate patients on the use, administration and adverse effects of antimicrobial agents. In addition, patients should also be informed about the importance of completing an antimicrobial course of therapy
Director of Infection Prevention and Control (DIPC)	<ul style="list-style-type: none"> • Overall responsibility for overseeing the Antimicrobial Stewardship Policy and its implementation • Ensuring regular review of the Trust Policy, promoting Trust wide awareness of the Policy, and overseeing the monitoring of adherence to the policy.
Microbiologists	<ul style="list-style-type: none"> • Act as a source of expert advice on the use of antimicrobial agents and the management of specific patients and infections • Advise on the appropriateness of the inclusion of an antimicrobial in the development of antimicrobial prescribing policies/guidelines and patient group directions (PGD) • Provide input into the development and provision of training on appropriate use of antimicrobials • Work with the Lead Pharmacist for Vaccination and Antimicrobials to monitor and advice on the audit of antimicrobial prescribing
Senior Health Professionals	<ul style="list-style-type: none"> • Promote antimicrobial stewardship within their teams, recognising the influence that senior prescribers can have on the prescribing practices of colleagues
Chief Pharmacist	<ul style="list-style-type: none"> • Supporting and promoting awareness of the Trust Policy through the activities of the Trust pharmacists
Divisional Nursing Directors	<ul style="list-style-type: none"> • Supporting the Trust Policy within their division.
Medical Director	<ul style="list-style-type: none"> • Supporting the implementation of the Trust Policy and addressing non-compliance with prescribing within ELFT

Appendix B – Definitions Used

Antimicrobial agents / medicine: this includes medicines for treating bacterial, fungal,

viral and parasitic infections.

Antimicrobial formulary: Antimicrobials included in the ELFT formulary have been agreed with input from local microbiologists, according to local processes and procedures. New antimicrobials will not be added to the ELFT formulary without advice from and agreement with the local microbiology services, following local formulary development procedures. Non-formulary antimicrobials should not be used except on the advice of the microbiologist.

Antimicrobial Treatment guidelines: Guidelines are based on evidence and nationally approved guidelines when available. It is understood that guidelines will be followed when appropriate, but it is impractical to produce guidelines to cover all eventualities. Where guidelines do not exist or when prescribing has to deviate from guidance (i.e. failing therapy, allergy), a discussion should be had with a medical microbiologist (see *Appendix C* for contact details).

Restricted Antimicrobials: Certain antimicrobial agents are designated as 'restricted' antimicrobial agents according to local processes and procedures to help ensure the effectiveness of antimicrobials is preserved and reduce the emergence of resistance. Restricted antimicrobials must not be prescribed without the discussion and authorisation of the microbiologist.

Within ELFT restricted antimicrobials are defined according to areas covered by local microbiology services and guidelines (refer to *Appendix C*).

Health and Social care practitioner: A term used to define the wider care team including but not limited to GPs, dentists, podiatrists, pharmacists, pharmacy technicians, nurses, consultants, registrars, Junior doctors microbiologists, infection control staff, community nurses, community matrons, case managers, domiciliary care workers, care home staff and social workers.

Prescribers: This includes medical and non-medical prescribers

C.Difficile: Clostridium Difficile

CPE: Carbapenemase Producing Enterobacteriaceae

ESBL: Extended-Spectrum Beta-Lactamases

HCAI: Healthcare Acquired Infections

IPC: Infection Prevention and Control

IPCC: Infection Prevention and Control Committee.

IV: Intravenous

MRSA: Meticillin Resistant Staphylococcus Aureus

UKHSA: UK Health Security Agency

PHE: Public Health England

PO: Oral

VRE/GRE: Vancomycin Resistant Enterococci / Glycopeptide Resistant Enterococci

Appendix C - lists the antimicrobial guidelines to be followed per site

The following provides the local Antimicrobial treatment guideline that should be used at each site across ELFT. Further advice relating to specific patients can be obtained from

the local Consultant Microbiologist / ELFT Infection Control doctor. Please contact the appropriate microbiology department and ask for the duty consultant / registrar. Out of hours advice will be via the respective on-call service. The Lead Pharmacist ensures that the most up-to-date antimicrobial guideline is being used at their respective site.

See section 4.1 Antimicrobial Guidelines and Resources for more information

ELFT services are associated with various partner organisations (Acute Hospital Trusts and Clinical Commissioning Groups (CCGs)) in certain areas and follow their antimicrobial treatment guidelines and formularies. ELFT works closely with the Trust responsible for the guideline and will ensure that the formulary is maintained and reviewed regularly. The formulary will indicate restrictions for use where necessary for specific agents.

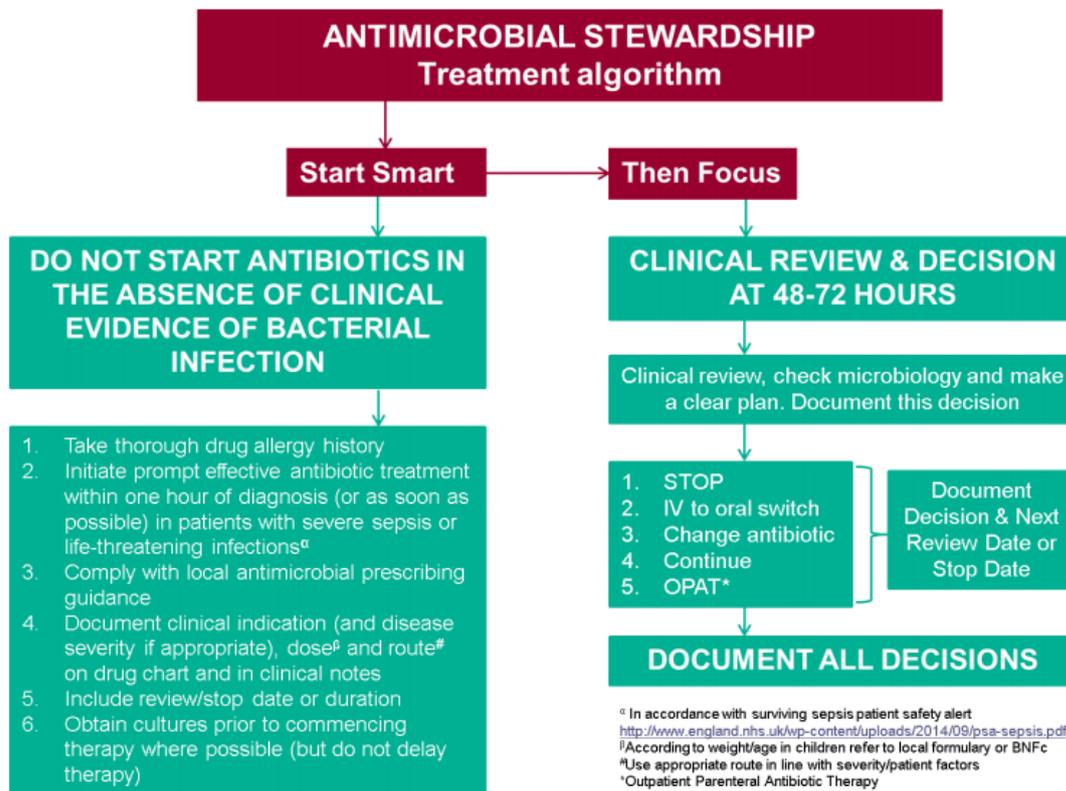
Locality	Antimicrobial Guideline to be used	Path Lab
Bedfordshire & Luton	<p>Bedfordshire CCG and Luton Guidelines https://www.bedsformulary.nhs.uk/</p> <p>Bedford hospital: https://www.bedsformulary.nhs.uk/</p> <p>L&D Hospital https://www.bedsformulary.nhs.uk/docs/232%20Antimicrobial%20Prescribing%20Guidelines_2015.pdf?UNLID=40736298020197310116</p> <p>B&L community: https://medicines.blmccg.nhs.uk/wp-content/uploads/2020/09/antimicrobial-guidelines-updated-march-2021-NC.pdf</p>	<p><i>Bedford:</i> Bedford Hospital Path Lab – South Wing (courier collects specimens at 11:00hrs and 15:00hrs)</p> <p><i>Luton:</i> Luton and Dunstable Hospital Path Lab (staff take specimens directly to the L&D path lab)</p>
City and Hackney	<p>Homerton University Hospital Antimicrobial Guide https://viewer.microguide.global/HU/H/ADULT</p>	<p>Staff take specimens directly to the Homerton path lab</p> <p>Path Lab number: 0208510 7899 / 7889/7892</p>
Newham (inc CHN) and Tower Hamlets	<p><i>For Secondary Care:</i> Barts Health NHS Trust Antimicrobial Guide https://viewer.microguide.global/BARTS/ADULT</p> <p><i>For Primary care:</i> North East London (NEL) Management of Infection Guidance</p>	<p>Switchboard number for Path Lab: 02073777000</p>

Resources:

As well as local antimicrobial guidelines prescribers can refer to the following resources for guidance on antimicrobial prescribing:

- Public Health England: Primary Care Guidance: Diagnosing and Managing Infections: <https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections#documents>
- NICE Pathways: <https://pathways.nice.org.uk/>
- NICE Guidance: Respiratory tract infections (self-limiting): prescribing antibiotics <https://www.nice.org.uk/guidance/cg69>
- TARGET toolkit (Treat Antibiotics Responsibly, Guidance, Education, Tools)
- Start SMART, then FOCUS Toolkit https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/417032/Start_Smart_Then_Focus_FINAL.PDF

Appendix D - Start Smart Then Focus Algorithm



Appendix E – Hypersensitivity Reactions and Allergy Status

Hypersensitivity reactions can be broadly classified into four groups according to the time to onset of symptoms following administration of the medicine¹. These are:

- **Immediate (Type I):** This occurs less than 1 hour after drug administration. Classical signs and symptoms include (either alone or in combination): anaphylactic shock, widespread urticaria (hives), angioedema (swelling of lips, tongue), broncho-constriction, diffuse erythema, pruritus, laryngeal oedema, hyperperistalsis, hypotension, or cardiac arrhythmias.
- **Accelerated:** This usually occurs 1 - 72 hours following medication administration. This type of reaction usually results in symptoms of urticaria, morbilliform rash, pruritus, erythema multiforme, bullous erythema or erythroderma (generalised redness of the whole body).

- **Late:** This usually occurs longer than 72 hours after medication administration. The typical manifestation of this type of reaction is a maculopapular morbilliform rash which is usually localised to the arms or legs.

Other less common hypersensitivity reactions which occur after 72 hours include the following:

- **Type II reactions** - such as renal conditions (interstitial nephritis) or blood disorders (leucopenia, thrombocytopenia, anaemia). These may be a complication of long term & high-dose treatment, such as for endocarditis
- **Type III reactions** - serum sickness, giving rise to skin rash, joint pains and fever (at 7-14 days)

Pseudo allergic reactions: A condition named for its similar presentation to a true allergy, though due to different causes. It may be due to alterations in the metabolism of histamine. It can be the cause of some forms of food intolerance. An example of a pseudo allergic reaction is red-man syndrome with Vancomycin.

Amoxicillin will produce a widespread morbilliform rash in patients with acute Epstein-Barr Virus (EBV) infection. This is not a manifestation of true allergy and does not recur when patients who have recovered are re-challenged with amoxicillin.

Appendix F – Penicillin Allergy Poster

PENICILLIN ALLERGY

All medication allergies with the patients reaction must be specified on the prescription chart and medical record

In severe penicillin allergy ALL penicillin, cephalosporin and other beta-lactam antibiotics should be avoided

<p>IMMEDIATE SEVERE PENICILLIN ALLERGY: Time to on set: Usually < 1 hour after administration</p> <p>Anaphylaxis and / or hypotension, laryngeal oedema, wheezing, angioedema or urticaria</p>	<p>DELAYED SEVERE PENICILLIN ALLERGY: Time to on set: Usually >72 hours after administration</p> <p>Serum sickness-like reaction (Vasculitic rash), Drug rash with eosinophilia and systemic symptoms (DRESS), Stevens-Johnson Syndrome / Toxic epidermal necrolysis</p>	<p>NON-SEVERE PENICILLIN ALLERGY: Time to on set: Usually more than 72 hours after administration</p> <p>Contact dermatitis Maculopapular / morbilliform rash Serum sickness (fever, rash, arthralgia, glomerulonephritis)</p>																										
<p style="text-align: center; font-weight: bold; margin: 0;">CONTRA-INDICATED</p> <p>Antibiotics to be <u>avoided</u> in penicillin allergy</p> <p>Amoxicillin Ampicillin Benzylpenicillin (Penicillin G) Co-amoxiclav (Augmentin®) Co-fluampicil Flucloxacillin Phenoxyethylpenicillin (Penicillin V) Piperacillin / Tazobactam (Tazocin®) Pivmecillinam Temocillin Ticarcillin (Timentin®)</p>	<p style="text-align: center; font-weight: bold; margin: 0;">CAUTION</p> <p>Antibiotics to be <u>used with</u> caution in non-severe penicillin allergy</p> <p><u>Cephalosporins</u> Cefradine, Cefalexin, Cefixime, Cefotaxime, Ceftazidime, Ceftriazone, Cefuroxime, Cefuroxime</p> <p><u>Carbapenems</u> Ertapenem, Imipenem, Meropenem</p> <p><u>Other beta-lactam antibiotics</u> Aztreonam, (May be used with caution in severe penicillin allergy under specialist advice ONLY)</p>	<p style="text-align: center; font-weight: bold; margin: 0;">CONSIDERED SAFE</p> <p>Antibiotics safe in penicillin allergy (Not an exhaustive list)</p> <table style="width: 100%; font-size: small;"> <tr> <td>Amikacin</td> <td>Azithromycin,</td> </tr> <tr> <td>Ciprofloxacin</td> <td>Clarithromycin,</td> </tr> <tr> <td>Clindamycin</td> <td>Colistin,</td> </tr> <tr> <td>Co-trimoxazole</td> <td>Daptomycin,</td> </tr> <tr> <td>Doxycycline</td> <td>Erythromycin,</td> </tr> <tr> <td>Fosfomycin</td> <td>Gentamicin,</td> </tr> <tr> <td>Levofloxacin</td> <td>Linezolid</td> </tr> <tr> <td>Metronidazole</td> <td>Nalidixic acid</td> </tr> <tr> <td>Nitrofurantoin</td> <td>Ofloxacin</td> </tr> <tr> <td>Rifampicin,</td> <td>Sodium Fusidate</td> </tr> <tr> <td>Teicoplanin,</td> <td>Tetracycline</td> </tr> <tr> <td>Tigecycline</td> <td>Tobramycin</td> </tr> <tr> <td>Trimethoprim</td> <td>Vancomycin</td> </tr> </table>	Amikacin	Azithromycin,	Ciprofloxacin	Clarithromycin,	Clindamycin	Colistin,	Co-trimoxazole	Daptomycin,	Doxycycline	Erythromycin,	Fosfomycin	Gentamicin,	Levofloxacin	Linezolid	Metronidazole	Nalidixic acid	Nitrofurantoin	Ofloxacin	Rifampicin,	Sodium Fusidate	Teicoplanin,	Tetracycline	Tigecycline	Tobramycin	Trimethoprim	Vancomycin
Amikacin	Azithromycin,																											
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Trimethoprim	Vancomycin																											

Appendix G – IV to Oral Switch

The intravenous route should be reserved for patients who are severely ill, unable to tolerate oral treatment, or where oral therapy would not provide

adequate coverage or tissue penetration

Antimicrobials prescribed via the IV route must be reviewed within 48 hours to 72 hours in all health care settings (including community and outpatient services).

The response to treatment and microbiological results should form part of the review, to determine if the antimicrobial needs to be continued and if so whether it can be switched to oral antimicrobial.

The review must be documented in the patient medical record along with reasons for stopping, switching to oral or continuing with the IV antimicrobial.

IV antimicrobial therapy must be reviewed as outlined above and switched to the oral route as soon as it is clinically appropriate to do so.

All of the criteria below should be met before switch to oral therapy:

- **Clinical improvement.** Signs & symptoms of infection improving & haemodynamically stable.
- **Oral route not compromised.** Able to tolerate oral fluids, no malabsorption problems, suitable oral antimicrobial available.
- **Markers show trend towards normal.** Temperature resolving, White Cell Count (WCC) and C-Reactive Protein (CRP) normalising, Heart Rate (HR) <90bpm, Blood Pressure stable, Respiratory rate <20 breath. s/min
- **Specific** indication/deep seated infection requiring high tissue concentrations not present (see exclusion criteria)

Exclusion criteria

Deep seated infections where high tissue concentrations are essential, and therefore require prolonged IV therapy e.g.

- Sepsis including neutropenic sepsis
- Central Nervous System infections (meningitis, encephalitis, brain abscess)
- Abscess (deep abscess, liver, lung)
- Endocarditis
- Empyema
- Cystic fibrosis
- Bone & joint infections – osteomyelitis, septic arthritis
- Severe soft tissue infections (necrotising fasciitis, severe cellulitis)
- Staphylococcal bacteraemia IV therapy should be reviewed every 48 hours with a view to switch to oral as soon as appropriate.