Title: Antimicrobial Prescribing Policy

Southampton University Hospitals NHS Trust

June 2007

Issued June 2007

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SOUTHAMPTON UNIVERSITY HOSPITALS NHS TRUST

Antimicrobial Prescribing Policy

1. Purpose of this Policy

1.1 Summary

The purpose of this policy is to outline the principles of good antimicrobial prescribing, the Trust policy for prudent antimicrobial prescribing and the Trust strategy for continually monitoring and improving the quality of antimicrobial prescribing.

1.2 Objectives/ success factors

The objectives of this Policy/Guideline/procedure are:

- *To raise awareness of the principles of good antimicrobial prescribing*
- *To improve the quality of antimicrobial prescribing and reduce inappropriate prescribing*

The anticipated outcomes of improved antimicrobial prescribing are:

- To reduce morbidity and mortality from infection
- To reduce the length of infection-related illness and hospital stay
- To reduce infection-related complications and readmissions
- To reduce the risk of adverse drug reactions to antimicrobials
- To decrease antimicrobial resistance and hospital-acquired infection
- To increase patient satisfaction and improve the patient experience at SUHT
- To increase patient / public / commissioner confidence in antimicrobial governance at SUHT
- To increase cost-effectiveness of antimicrobial therapy**Scope of this Policy**

This Policy/Guideline/procedure includes:

- *Principles of good antimicrobial prescribing*
- *SUHT policy for prudent antimicrobial prescribing*
- *SUHT strategy for antimicrobial stewardship and containment of antimicrobial resistance*

3. Links to other key Strategies & Policies

- *Insert here*

4. Breach of this Policy and responsibilities of all staff

- **All medical and non-medical prescribers** are responsible for making themselves familiar with the trust policy and for adhering to the policy.
- **The director of infection prevention and control (DIPC)** has overall responsibility for the content, implementation and monitoring of the trust antimicrobial prescribing policy.
- **The medical director** will receive monthly reports of unauthorised prescribing of alert antimicrobials and is responsible for addressing unauthorised prescribing with the relevant clinical directors.
- **The clinical directors** are responsible for supporting the Trust antimicrobial prescribing policy and addressing non-compliance with the policy within their divisions.
- **The consultant pharmacist anti-infectives** is responsible for co-ordinating annual review of the trust antimicrobial prescribing policy, promoting awareness of the policy amongst prescribers and pharmacists, designing and implementing initiatives to support adherence to the policy, auditing adherence to the policy and reporting audit findings to the DIPC.
- **The chief pharmacist** is responsible for supporting the trust antimicrobial prescribing policy through the activities of the trust pharmacists.

- **All trust pharmacists** are responsible for making prescribers aware of the policy, encouraging adherence to the policy and for reporting non-adherence to a consultant microbiologist or the consultant pharmacist anti-infectives.

- Non-compliance with a Trust Policy, Procedure, Guideline, PGD, protocol or patient information standard **may result in disciplinary action.**

5. Principles of good antimicrobial prescribing

- *Antimicrobial therapy should not be started without clear and documented justification*
- *Antimicrobial therapy should be used solely as an adjunct in cases where surgery or wound management is the primary intervention*
- *Every effort should be made to collect relevant specimens for microbiological investigations prior to starting antimicrobial therapy*
- *The indication and choice of antimicrobial agent(s) should be clearly documented*
- *The anticipated course length or review date should be clearly documented*
- *Antimicrobial therapy should be prescribed according to guidelines developed locally and informed by local pathogen epidemiology and local antimicrobial sensitivity patterns*
- *Narrow-spectrum antimicrobial agents should be prescribed in preference to broad-spectrum agents where appropriate*
- *Empirical (best-guess) antimicrobial prescriptions should be reviewed no later than 48 hours and de-escalated to narrow spectrum agents promptly when appropriate*
- *Antimicrobial prophylaxis for surgery should be limited to a single dose for the majority of surgical procedures*
- *Antimicrobial therapy should be prescribed at an appropriate dose and frequency*
- *The oral route should be used for antimicrobial therapy in preference to the intravenous route wherever possible*
- *Intravenous antimicrobial therapy should be reviewed within 48 hours and switched to oral therapy if appropriate*
- *Antimicrobial therapy courses should be reviewed after no later than 5 days and discontinued as soon as infection has resolved*
- *Expert advice should be sought from a medical microbiologist for complicated infections, interpretation of culture and sensitivity results or in the case of failure of empirical treatment.*

6. Standards to be followed

6.1 Prudent Antimicrobial Prescribing

6.1 **Do not start antimicrobial therapy without clear clinical justification.**
Patients who receive antimicrobial therapy are at increased risk of colonisation and infection with *Clostridium difficile*, MRSA and other multi-resistant pathogens. Patients should not be subjected to this increased risk without reasonable evidence of infection or established prophylactic benefit. See Appendix 1 for sepsis definitions.

6.2 **Document the indication for antimicrobial therapy in the case notes and on the drug chart and record a stop date or a review date on the drug chart.**
Review of antimicrobial therapy by medical colleagues following transfer of care is facilitated by clear documentation of the reason for initiating prescribing and the original intended course length. In general, antimicrobial courses must be reviewed within **5 days** (48 hours for intravenous antimicrobials).

6.3 **Antimicrobial therapy should be used solely as an adjunct in cases where surgery or wound management is the primary intervention**

The presence of foreign bodies has a profound effect on the activity of antimicrobial agents and it is often necessary to remove the foreign material to cure an infection in the vicinity of a foreign body such as a prosthetic heart valve or joint implant. Similarly, drainage of infected abscesses or empyema and debridement of necrotic tissue is critical to successful outcomes.

6.4 **Before starting antimicrobial therapy, make every effort to collect relevant specimens for microbiological investigations**

Cultures are important to isolate the infecting organism and determine the presence of antimicrobial resistance. The sender of a specimen for culture is responsible for checking the culture result, whether they are medical or nursing staff, and antimicrobial therapy must be amended accordingly. Medical microbiology will directly contact medical staff if blood cultures or multi-resistant organisms are isolated.

6.5 Prescribers must follow Trust guidelines for the treatment of infection or the British National Formulary where Trust guidelines do not exist

Local guidelines are developed to be consistent with local pathogen epidemiology and antimicrobial sensitivity patterns. Guidelines recommend antimicrobial agents known to penetrate to the site of infection and supported by evidence of clinical efficacy for each indication.

6.6 **Non-formulary antimicrobials must not be prescribed without authorisation from a consultant microbiologist or the Trust medical director**

Antimicrobials on the Trust formulary have been reviewed by the Trust Drugs Committee for cost-effectiveness, safety and the propensity to cause resistance. All new antimicrobials must be subject to this peer review process before consideration for the Trust formulary.

Examples of non-formulary antimicrobials include:

Levofloxacin
Moxifloxacin
Posaconazole
Telithromycin

6.7 **Alert antimicrobials must not be prescribed without authorisation from a consultant microbiologist or the Trust medical director unless in accordance with a Trust guideline or antimicrobial sensitivity report**

Certain antimicrobial agents have been designated as ‘alert’ antimicrobials by the Trust Drugs Committee for reasons of broad spectrum of activity, potential toxicity, potential for error or prohibitive cost. Pharmacists are required to confirm authorisation before dispensing alert antimicrobials. Breaches of the alert antimicrobial policy will be reported to the Medical Director. Details of the alert antimicrobial policy are provided in Appendix 2.

6.8 **Narrow-spectrum antimicrobial agents should be prescribed in preference to broad-spectrum agents where appropriate**

Broad-spectrum agents cause the most collateral damage to non-pathogenic normal flora, which form an integral component of the host defence against infection by competing with pathogens for nutrients and producing antibiotic secretions. Broad-spectrum agents also apply selection pressure to colonising bacteria increasing the risk of a patient becoming colonised with antimicrobial-resistant strains, which may later cause infection unresponsive to first-line antimicrobials. Refer to Trust antimicrobial

therapy guidelines for recommended narrow spectrum agents for defined clinical indications.

6.9 Broad-spectrum empirical antimicrobial therapy may be indicated in certain circumstances. Examples are listed below.

6.9.1 For patients with life-threatening infection or severe sepsis for whom prompt appropriate therapy is critical to a successful outcome.
6.9.2 For patients who are immunosuppressed – refer to local guidelines.
6.9.3 For patients with suspected or confirmed polymicrobial infection.
6.9.4 For patients who have been recently exposed to antimicrobial agents or failed first-line therapy with more narrow spectrum antimicrobial agents.
6.9.5 For patients who are at risk of infection with resistant microorganisms due to recent contact with a healthcare environment or exposure to antimicrobials.
6.9.6 For patients with a laboratory-confirmed resistant microorganism.
6.9.7 For patients with a history of colonisation or infection with resistant microorganisms in the previous year.

6.10 **Empirical antimicrobials must be reviewed no later than 48 hours and de-escalated to narrow spectrum agents promptly when appropriate**

Step-down to narrow spectrum therapy if a causative organism is identified and antimicrobial sensitivity data are available. Prolonged treatment with broad-spectrum antimicrobials increases selection pressure for multi-resistant microorganisms and limits options for salvage therapy in patients who later relapse.

6.11 **Antimicrobial prophylaxis for surgery must not be prescribed beyond 24 hours for the majority of surgical procedures**

Established infection discovered during surgery is an indication for converting antimicrobial prophylaxis into a treatment course.

6.12 **Antimicrobial therapy must be prescribed at an appropriate dose, as recommended in Trust guidelines or the BNF**

The dose must be appropriate for the patient's renal and hepatic function. Consult a pharmacist if a patient has renal or hepatic impairment. Trust guidelines for dosing of aminoglycoside (e.g. gentamicin) and glycopeptide (e.g. vancomycin) antimicrobials must be followed to minimise the risk of treatment failure or toxicity.

6.13 **The oral route of administration for antimicrobials is preferred to the intravenous route wherever possible. Intravenous antimicrobial therapy is indicated in certain circumstances including:**

Refer to Appendix 3 for indications for intravenous therapy.

6.14 **Intravenous antimicrobial therapy must be reviewed at 48 hours and switched to oral alternatives when clinically appropriate**

Unnecessarily prolonged intravenous therapy exposes patients to risks of intravascular device-related infection, bacteraemia and thrombophlebitis, and has been shown to delay discharge from hospital. Switch to oral antimicrobial agents should be considered for patients who meet the criteria outlined in Appendix 4.

7. Strategy for containment of antimicrobial resistance

7.1 **Antimicrobial management team**

An antimicrobial management team (AMT) will be convened monthly to review antimicrobial usage data and to plan, implement and evaluate initiatives to improve

the quality of antimicrobial prescribing. Membership of the AMT will include a consultant medical microbiologist and a microbiology pharmacist.

7.2 **Expert advice and microbiology ward rounds**

The medical microbiologists and the microbiology pharmacists in the Trust will provide specialist advice over the telephone and on microbiology ward rounds. Medical or pharmacy staff may refer cases.

7.3 **Antimicrobial formulary and alert antimicrobials**

The number of antimicrobial agents available for prescribing at the Trust is limited through the formulary. Ward pharmacists will refer prescriptions for non-formulary antimicrobials to the microbiology pharmacists or to medical microbiology for authorisation. Addition of new agents to the formulary will be subject to a review of cost-effectiveness, safety and propensity to induce resistance by the Trust Drugs Committee, advised by the AMT.

Alert antimicrobials are so designated by virtue of their broad spectrum of activity, potential toxicity, potential for error or prohibitive expense. The AMT will review and update the list of alert antimicrobials annually and disseminate to prescribers and pharmacists. Adherence to the alert antimicrobial policy will be evaluated through point prevalence audits described below. Reports of non-compliance to the alert antimicrobial policy will be collated and reviewed by the AMT for submission to the Medical Director monthly.

7.4 **Education and training**

A rolling program of education and training on the appropriate use of antimicrobials will be delivered by the AMT to target audiences including junior doctors, clinical pharmacists and nurses. Prescribers will be made aware of this policy and their responsibilities at induction.

7.5 **Clinical practice guidelines**

Guidelines for the investigation and management of patients with infection will be made available via the Trust intranet. Guidelines will be reviewed every two years by the antimicrobial management team and updated as required.

7.6 **Monitoring and feedback**

Reports of antimicrobial usage trends will be produced monthly and reviewed by the AMT. Unexpected changes in usage patterns will be investigated by the AMT and action taken to address inappropriate prescribing if necessary.

Reports of usage trends of selected alert antimicrobials (e.g. broad spectrum antimicrobials) by individual divisions will be produced quarterly by the AMT and disseminated to the divisions via lead clinical pharmacists for discussion at the appropriate divisional meetings.

A point prevalence survey of antimicrobial prescribing will be conducted Trust-wide at least annually by the AMT to evaluate the quality of prescribing. The data will be reviewed by a medical microbiologist to identify inappropriate prescribing and results will be fed back to divisions.

7.7 **Antibiotic sensitivity reporting**

Antibiotic sensitivity results will be censored by medical microbiology before reporting on the Trust eQuest pathology results system. Sensitivity results will not be released

for organisms likely to be normal flora when infection is unlikely. Sensitivity results released to clinicians on the wards will include sensitivity to formulary antibiotics only and will offer narrow-spectrum agents in preference to broad-spectrum agents wherever possible.

Antibiotic sensitivity results will be collated annually for the entire Trust by the AMT and published on the hospital intranet for reference.

7. Communication and Education Plan for this document

7.1 Communication and Dissemination Plan

- *Divisional meetings*
- *SUHTranet infection website*
- *Induction for doctors and pharmacists*

7.2 Education and Support Plan

- *Rolling programme of education on the subject of prudent antimicrobial prescribing for all prescribers and pharmacists.*
- *Incorporation into future competency assessments for prescribers.*

8. Review plan for this document

- *This policy will be reviewed annually by the consultant pharmacist anti-infectives and the AMT*

END

9. Appendix 1 – Sepsis definitions

Infection
Presence of microorganisms in a normally sterile site.

Bacteraemia
Cultivatable bacteria in the bloodstream.

Systemic Inflammatory Response Syndrome (SIRS)
SIRS is the systemic response to a wide range of stresses and is defined in adult patients as TWO or more of:

- Temperature >38ºC or <36ºC
- Heart rate >90 beats per minute
- Respiratory rate >20 breaths per minute OR PaCO2 <32mmHg
- WBC >12 x 106 cells / mL or < 4 x 106 cells / mL OR >10% immature (band) forms

Sepsis
Sepsis is defined as SIRS associated with proven or clinically suspected infection

Severe sepsis
Sepsis associated with organ dysfunction (distant from infection site), hypoperfusion or hypotension (systolic BP <90mmHg, MAP <70mmHg or reduction of 40mmHg from baseline).

Septic shock
Sepsis with hypotension requiring pressor therapy despite adequate fluid resuscitation. In addition there are perfusion abnormalities that may include lactic acidosis, oliguria, altered mental status and acute lung injury.

Septicaemia
Sepsis associated with bacteraemia.

10. Appendix 2 – Alert antimicrobial policy

Certain antimicrobial agents have been designated as 'alert' antimicrobials by the Trust Drugs Committee for reasons of broad spectrum of activity, potential toxicity, potential for error or prohibitive cost. Pharmacists are required to confirm authorisation before dispensing alert antimicrobials. Breaches of the alert antimicrobial policy will be reported to the Medical Director.

Red Alert Antimicrobials
Clinical microbiologists can authorise prescription of red alert antimicrobials for individual patients and authorisation will be documented on the pathology computer system and/or in the patient's medical notes. Pharmacists are required to confirm authorisation before dispensing red alert antimicrobials.

Red Alert Antimicrobials are:
- Daptomycin
- Linezolid
- Synercid
- Tigecycline
- Rifampicin monotherapy
- Fusidic acid monotherapy

Amber Alert Antimicrobials
Amber alert antimicrobials must be prescribed in accordance with an approved Trust guideline or antimicrobial sensitivity report. Clinical microbiologists can authorise off-guideline prescription of amber alert antimicrobials for individual patients and authorisation will be documented on the pathology computer system and/or in the patient's medical notes. Pharmacists will refer unauthorised off-guideline use of amber alert antimicrobials to the weekly microbiology ward round or more promptly by telephoning microbiology, at the pharmacist's discretion.

Amber Alert Antimicrobials are:
- Tazocin
- Carbapenems (Ertapenem, Imipenem, Meropenem)
- Third-generation cephalosporins (Cefotaxime, Ceftriaxone, Cefixime, Ceftazidime)
- Colistin
- AmBisome
- Caspofungin
- Voriconazole

11. Appendix 3 – Indications for <u>intravenous</u> antimicrobial therapy

- For patients who are strictly nil-by-mouth.
- For patients with non-functional GI tract or malabsorption.
- For life-threatening infections or severe sepsis - to be reviewed at 48 hours.
- For patients with bacteraemia due to *Staphylococcus aureus* or *Pseudomonas aeruginosa* – to be reviewed at 48 hours.
- For patients with serious deep-seated infections requiring intravenous antimicrobials to guarantee adequate drug levels at the site of infection. Examples include:
    - meningitis
    - intracranial abscess
    - liver abscess
    - endocarditis
    - legionella pneumonia
    - exacerbations of cystic fibrosis
    - mediastinitis
    - inadequately drained abscesses
    - empyema
    - severe soft tissue infections such as
        - group A streptococcal infections
        - infections of foreign bodies
        - osteomyelitis
        - septic arthritis.

12. Appendix 4 – IV-to-oral switch criteria

Switch to oral antimicrobial agents should be considered for patients who meet all of the following criteria (Sevinc F et al 1999):

- Completed 48-72 hours of intravenous therapy.
- Condition of the patient is improving.
- Haemodynamically stable.
- Trend towards normalisation of body temperature and peripheral leucocyte count.
- Able to tolerate oral medication and appropriate oral antimicrobial available.
- Functioning gastrointestinal tract without signs of malabsorption.
- No serious deep-seated infection. For example:
  - meningitis
  - intracranial abscess
  - liver abscess
  - endocarditis
  - legionella pneumonia
  - exacerbations of cystic fibrosis
  - mediastinitis
  - inadequately drained abscesses
  - empyema
  - severe soft tissue infections such as
    - group A streptococcal infections
    - infections of foreign bodies
    - osteomyelitis
    - septic arthritis.
- Treatment for liver abscesses, adequately drained abscesses and empyemas, osteomyelitis and septic arthritis can be changed to oral therapy after $\geq$2 weeks of intravenous therapy.