GOOD PRACTICE GUIDANCE FOR ANTIBIOTIC PRESCRIBING IN HOSPITAL

Prepared by the Scottish Infections Standards and Strategies (SISS) Group*

INTRODUCTION

Hospitals are facing a worsening crisis due to the rapid emergence and dissemination of antimicrobial-resistant microorganisms. While dissemination of resistant organisms is in part attributable to poor infection control techniques,[1] the emergence of resistant strains is, to a large extent, related to the excessive and inappropriate use of antimicrobials.[2] The problem of inappropriate antimicrobial use has been highlighted, and responded to, in previous reports from the UK and elsewhere.[3–5] The prudent use of antimicrobials in humans is part of the UK Antimicrobial Resistance Strategy and Action Plan,[6] which has already been adopted in Scotland.[7] Guidelines for the treatment and prophylaxis of infection are a key requirement of the NHS Quality Improvement Scotland (formerly Clinical Standards Boards for Scotland) Standards for Healthcare associated infection.[8]

By means of providing auditable good practice statements, the SISS guidance seeks to encourage and facilitate compliance with good antimicrobial prescribing in hospitals. The statements are based on current available recommendations, evidence or good practice.[2, 3, 7, 9–12]

REMIT AND SCOPE

- To provide clinicians and organisations with good practice guidance related to antimicrobial prescribing.
- Statements of good practice should be suitable for internal or external peer review.
- The good practice statements are achievable and measurable.
- They do not purport to be all-encompassing standards for good antimicrobial practice but set out a series of minimum achievable goals for Scottish hospitals.
- Each statement is accompanied by a mechanism to verify its importance and monitor its progress.

It is *not* within the remit of this document to produce an evidence-based guideline or clinical algorithms of care. Therefore, we have not supported any of the good practice or guidance statements with specific references. These statements are based on the recommendations outlined in a number of key reports,[2, 3, 7, 9, 13] key existing literature which is referenced, a broad consensus of clinical and public health experience, and the expertise of the working-party members. General practice representation was not sought for these statements.

We have used a method similar to that of the CRAG 2002 (Clinical Resource Audit Group) *Good Practice Statements for the Preparation of Injections in Near-Patient Areas, including Clinical and Home Environments* (www.scotland.gov.uk). We did not provide a reason for the statements which we believe are self-explanatory and well-established or identify the requirement for local action, although we do provide verification criteria. Future SISS good practice statements will use the same method.

Nevertheless, we believe these statements represent a robust set of recommendations to guide good practice.[14] They could form the basis of future standards that would need to be developed according to the NHS Quality Improvement Scotland recommended methodology (www.nhshealthquality.org). These standards would form the basis for internal or external quality assessment.

DEVELOPMENT AND REVIEW

These standards have been developed by a SISS working group in close collaboration with the Scottish Executive Health Department (SEHD) and the Scottish Centre for Infection and Environmental Health (SCIEH). Although they were subject to brief peer review (at the SISS National Meeting on 12 November 2002), all registered SISS members and affiliate societies, SEHD, SCIEH, NHS Quality Improvement Scotland and the British Infection Society Council have had the opportunity for review. Indeed, after the first round of consultation was completed on 21 January 2003, the working group has regrouped to redraft the final document. This publication is available in electronic format from the SISS website (www.rcpe.ac.uk, go to Search and type in SISS (http://www.rcpe.ac.uk/esd/clinical_standards/siss/siss_index.html)) with appropriate links to other relevant key sites.

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GOOD PRACTICE STATEMENT 1
Education and awareness
Statement 1A
All undergraduate and postgraduate medical, pharmacy and nursing curricula must include teaching about good antimicrobial prescribing practice. This ought to include an understanding of the core principles outlined in Appendix I and adopt a systems-based problem-orientated approach to education.[15]

Verification: consult core curriculum of medical/nursing/pharmacy school.

Statement 1B
All of the above organisations should identify a lead individual to take responsibility for coordinating the delivery of education and antimicrobial use.

Verification: named individual recognises, understands and accepts responsibility as lead person for antimicrobial education.

GOOD PRACTICE STATEMENT 2
Organisation
Statement 2A
Responsibility for antimicrobial management should be clearly defined and there should be clear lines of accountability for antimicrobial matters throughout the organisation.

Each organisation should identify an individual, or multidisciplinary team, to take overall responsibility for antimicrobial use within the organisation.

Verification: named individual/team recognises, understands and accepts overall responsibility for organisation-wide antimicrobial use. Named individual/team provides an annual written report on organisation-wide antimicrobial use.

Statement 2B
All hospitals should have an antibiotic management committee or equivalent responsible for drawing up guidelines for antibiotic prescribing within the hospital. The committee should include representation from medical microbiology, clinical infectious diseases (where available), pharmacy, surgery, medicine, paediatrics, junior hospital doctors and others where appropriate.

Verification: demonstration of the existence of an antibiotic committee with representation as listed above and copy of attendance record.

Statement 2C
All hospitals should have an antibiotic-prescribing formulary based on local epidemiology and resistance patterns.

Verification: hospital has an antibiotic prescribing formulary and can justify antimicrobial selection from local epidemiology/resistance. Availability of local resistance patterns.

Statement 2D
All hospitals should have a written antimicrobial management policy/guideline for common infections including antibiotic surgical prophylaxis and guidelines for selection of intravenous (IV) or oral antimicrobials. The policy should take account of available evidence-based information for managing these infections.

Verification: demonstration of the existence of hospital antimicrobial policy/guideline.

Statement 2E
Every hospital should have a list of antimicrobials which may only be prescribed by an appropriate specialist or according to pre-existing agreed criteria.

Verification: hospitals should be able to produce details of the restricted antibiotic list and of any agreed criteria for the prescription of restricted antibiotics.

Statement 2F
All policies/protocols/guidelines should be updated annually.

Verification: demonstration of meetings of the antibiotic management group where policies/protocols/guidelines are updated.

Statement 2G
All policies/protocols/guidelines should be supported by a continuing education programme. A continuing programme is required to take account of staff changes and provide up-to-date information.

Verification: number of relevant educational activities and attendance.

GOOD PRACTICE STATEMENT 3
Prescribing practice
Statement 3A
When antimicrobials are prescribed the following minimum information should be recorded in the medical case records within 24 hours of starting antimicrobials:

- presumed site of infection or symptoms of infection (if site unknown this should be stated);
- temperature;
- pulse rate;
- blood pressure;
- respiratory rate;
- white cell count and C-reactive protein (if available);
- type of microbiology specimens collected prior to antimicrobial administration; and

- antimicrobial prescribed – name, route and dose.

Verification: audit/review of patient case records.

Statement 3B
A minimum dataset of information should be recorded in the medical case records before antimicrobials are prescribed for surgical prophylaxis – see Appendix 2.[16]

Verification: audit/review of patient case records.

Statement 3C
Surgical prophylaxis should be continued for no longer than 24 hours.[16]

Verification: audit/review of patient case records.

Statement 3D
The antibiotic prescribed should comply with the hospital guidelines/policy. If another antibiotic is chosen the reason for its selection should be indicated in the medical case records.

Verification: audit/review of patient case records with reference to hospital guidelines/policy.

Statement 3E
The need for IV antimicrobial therapy should be reviewed daily by the attending team and/or pharmacist.

Verification: specific audit of practice.

GOOD PRACTICE STATEMENT 4
Audit
Statement 4A
At least one core component of antimicrobial practice should be reviewed annually and this information should be fed back to staff (Appendix 3).

Verification: evidence of audit and discussion of results with staff.

Statement 4B
Audit should be prioritised to core areas of concern or sub-optimal practice.

Verification: evidence of selective audit and its rationale.

Statement 4C
Hospital pharmacists should have a system to measure antibiotic usage within the hospital as a whole and within specific departments.

This should be represented as the defined daily doses (DDD)/100 bed days or DDD/1,000 bed days.

This information should be available to the antibiotic management team/committee and the trust Control of Infection Committee. The collection of this information should be supported by appropriate information technology.

Verification: publication of antibiotic usage within hospitals/departments as DDD/100 bed days or DDD/1,000 bed days.

Statement 4D
The antibiotic management subcommittee or equivalent should provide the Infection Control Committee and Trust Board with an annual report on antimicrobial management within the organisation.

Verification: publication of annual report.

DECLARATION OF INTERESTS
Ian Gould has undertaken consultancy work for Merk; he received lecture fees from Wyeth and Lilly; he received meeting hospitality from Bayer; he holds GlaxoSmithKline and Lilly shares; and he has received consultancy fees from Pharmacia, Abott and Pfizer. He has also received an educational grant from Pharmacia; a research grant from Forrest and Forrest Labs; meeting support from Zeneca; and has done research for Pfizer. He is also the President of the European Congress of Clinical Microbiology in Glasgow in 2003. Therefore most major companies are involved with him in a non-personal way.

Alistair Leanord has acted in an advisory capacity for Pharmacia for software development; in 1999 he received a research grant from Bayer; in 2000, 2001, 2002 and 2003 he was a sponsored delegate to International Meetings (Avantis, Bayer, Wyeth, Pfizer); he has also received and educational grant from Wyeth, Pfizer and Bayer.

Dilip Nathwani has been on the UK advisory board for Linezolid (Pharmacia-Pfizer), Moxifloxacin (Bayer) and Ertapenem (MSD). He has also been an invited speaker for Pharmacia-Pfizer and Bayer.

APPENDIX 1 (SEE REFERENCE 9)
- When should an anitibiotic be prescribed?
- Documentation of infection/inflammatory criteria in case records
- Selection of IV or oral therapy including switching from IV to oral therapy
- Optimum duration of therapy
- Use of antibiotic guidelines/policy
- The consequences of irresponsible use of antibiotics
- Recognise the causes and consequences of antimicrobial resistance

APPENDIX 2 (SEE REFERENCE 16)
- Date operation performed
- Justification for prophylaxis (e.g. evidence of high-risk of surgical site infection) if prophylaxis is given for an operation that is not one of the indications for routine prophylaxis

- Time of antibiotic administration
- Elective or emergency
- Name, dose, route of antibiotic
- Time of surgical incision
- Number of doses given
- Classification of operation (clean/clean-contaminated/ contaminated)
- Previous adverse reactions to antibiotics?
- Duration of operation
- Second dose indicated?
- Second dose given?
- Name of anaesthetist
- Name and designation of surgeon

APPENDIX 3

Areas of audit should include the following:

- compliance with the restricted antimicrobial list;
- timing of iv to oral antimicrobial switch;
- streamlining of antimicrobial therapy in light of microbiology reports;
- use of prophylactic antimicrobials in surgical practice;
- adherence to the hospital antibiotic policy/guidelines.

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