

IMPLEMENTING THE GUIDELINE

- Inappropriate prolongation of surgical prophylaxis can be reduced by use of specific prescribing forms for surgical prophylaxis, or recording of prophylaxis in single dose sections of existing drug prescription charts.**

AUDITING CURRENT PRACTICE

- All aspects of antibiotic prophylaxis, for example, where prophylaxis is not given when recommended, should be clearly recorded in the case records.
 - Locally agreed protocols should clearly indicate where to document antibiotic prophylaxis in the patient records (eg, the "once only" section of the drug chart, integrated care pathway or anaesthetic chart).
 - Record the minimum data set to facilitate audit of the appropriateness of surgical antibiotic prophylaxis
- D Short period audits held at regular intervals, with stakeholder feedback, are recommended.**
- The use of statistical process control to achieve effective, embedded change should be considered.
 - For audit, surgical site infections should be described following the CDC criteria.

PROVISION OF INFORMATION

Healthcare associated infection

- Healthcare professionals should provide information to patients and carers about HAI to raise awareness and reduce anxiety.

MRSA carriage

- Patients known to carry MRSA should receive information about the associated risks and about modification to procedures that may minimise the risks.

Surgical site infection

- All surgical departments should have information leaflets for patients about specific surgical procedures.
- Healthcare professionals should discuss the risks and benefits of antibiotic prophylaxis to reduce the risk of SSI with the patient.
- Patients should receive preoperative advice and information on how to reduce the risk of SSI.
- Healthcare professions should give patients advice and information on postoperative wound care and monitoring surgical wound for infection.
- Local information leaflets should be available.

SURGERY SPECIFIC QUICK REFERENCE GUIDES

Recommended indications for surgical antibiotic prophylaxis are available from the SIGN website as surgery specific QRGs. These can be annotated for use as local implementation tools.

ADULTS

Breast surgery
Cardiothoracic surgery
ENT surgery
Facial surgery
Gastrointestinal surgery
Gynaecological surgery
Head and neck surgery
Intracranial surgery
Limb surgery
Ophthalmic surgery
Urogenital surgery

CHILDREN

Gastrointestinal surgery
Head and neck surgery
Thoracic surgery
Urogenital surgery

www.sign.ac.uk/guidelines/fulltext/104/index.html

USEFUL PUBLICATIONS

HEALTH PROTECTION AGENCY

Monitoring surgical wounds for infection: information for patients
www.hpa.org.uk/infections/topics_az/surgical_site_infection/ssi_leaflet_final.Pdf

MRSA: information for patients

www.hpa.org.uk/infections/topics_az/staphylo/mrsa_leaflet.pdf

MRSA: information for patients in hospital

www.hpa.org.uk/infections/topics_az/surgical_site_infection/ssi_leaflet_final.pdf

ASSOCIATION OF MEDICAL MICROBIOLOGISTS

The facts about MRSA

www.amm.co.uk/files/factsabout/fa_mrsa.htm

The facts about clostridium difficile infection

www.amm.co.uk/files/factsabout/fa_cdif.htm

This Quick Reference Guide provides a summary of the main recommendations in the SIGN guideline on **Antibiotic prophylaxis in surgery**.

Recommendations are graded **A B C D** to indicate the strength of the supporting evidence. Good practice points are provided where the guideline development group wishes to highlight specific aspects of accepted clinical practice.

Details of the evidence supporting these recommendations can be found in the full guideline, available on the SIGN website: www.sign.ac.uk

GENERAL PRINCIPLES OF ANTIBIOTIC PROPHYLAXIS

- The final decision regarding the benefits and risks of prophylaxis for an individual patient will depend on:
 - the patient's risk of SSI
 - the potential severity of the consequences of SSI
 - the effectiveness of prophylaxis in that operation
 - the consequences of prophylaxis for that patient (*for example, increased risk of colitis*).

Dosage selection

- A single standard therapeutic dose of antibiotic is sufficient for prophylaxis under most circumstances.

Timing of administration

- B** **Intravenous prophylactic antibiotics should be given ≤ 30 minutes before the skin is incised.**

ADMINISTRATION OF PROPHYLACTIC ANTIBIOTICS

Choice of antibiotic

- C** **The antibiotics selected for prophylaxis must cover the expected pathogens for that operative site.**

- The choice of antibiotic should take into account local resistance patterns.

- Narrow spectrum, less expensive antibiotics should be the first choice for prophylaxis during surgery.

Route of administration - general

- Prophylactic antibiotics for surgical procedures should be administered intravenously.

Route of administration - surgery specific

- B** **Intranasal mupirocin should be used prophylactically for patients undergoing high risk surgery who are identified with *S. aureus* or MRSA.**

- B** **A single dose of topical antibiotic is recommended for insertion of grommets.**

- B** **In addition to intravenous antibiotics, impregnated cement is recommended for cemented joint replacements.**

- A** **Intracameral antibiotic prophylaxis is recommended for cataract surgery.**

- B** **Intracameral or intravitreal intraocular antibiotic prophylaxis is recommended at completion of surgery for penetrating eye injuries (*dependent on extent of injury and the presence or absence of an intraocular foreign body*).**

ADMINISTRATION OF PROPHYLACTIC ANTIBIOTICS (contd)

Duration of prophylaxis - general

- B** **A single dose of antibiotic with a long enough half-life to achieve activity throughout the operation is recommended.**

Duration of prophylaxis - surgery specific

- C** **An additional intraoperative dosage of antibiotic is recommended for cardiac surgery longer than four hours when using an antibiotic with pharmacokinetics equivalent to cefazolin.**

- B** **Up to 24 hours of antibiotic prophylaxis should be considered for arthroplasty.**

- Additional dosage may be indicated for longer surgery or shorter-acting agents to maintain activity for the duration of the operation.

RISK FACTORS FOR SURGICAL SITE INFECTION

Factors affecting the incidence of surgical site infection

	Risk factor
Patient	Extremes of age
	Poor nutritional state
	Obesity (>20% ideal body weight)
	Diabetes mellitus
	Smoking
	Coexisting infections at other sites
	Bacterial colonisation (eg nares colonisation with <i>S. aureus</i>)
	Immunosuppression (steroid or other immunosuppressive drug use)
	Prolonged postoperative stay
Operation	Length of surgical scrub
	Skin antisepsis
	Preoperative shaving
	Preoperative skin prep
	Length of operation
	Antimicrobial prophylaxis
	Operating theatre ventilation
	Inadequate instrument sterilisation
	Foreign material in surgical site
	Surgical drains
	Surgical technique including haemostasis, poor closure, tissue trauma
	Postoperative hypothermia

BENEFITS AND RISKS OF ANTIBIOTIC PROPHYLAXIS

Penicillin allergy

- Patients with a history of penicillin allergy should be reviewed to exclude a non-immunological adverse reaction, (*eg, diarrhoea, vomiting, non-specific maculopapular rash*) or, an experience wrongly attributed to the antibiotic (*eg, ampicillin and Epstein-Barr virus infection*).

- C** **Patients with a history of anaphylaxis, laryngeal oedema, bronchospasm, hypotension, local swelling, urticaria or pruritic rash, occurring immediately after a penicillin therapy are at potential increased risk of immediate hypersensitivity to beta-lactams and should not receive prophylaxis with a beta-lactam antibiotic.**

- Local policies for surgical prophylaxis that recommend beta-lactam antibiotics as first line agents should also recommend an alternative for patients with allergy to penicillins or cephalosporins.

Multiresistance carriage

- Carriage of multiresistant organisms should be recognised as a potential risk factor for surgical site infection during high risk operations (*eg, orthopaedic implant, heart valve, vascular graft or shunt or CABG*).

- For patients with suspected multiresistance carriage undergoing high risk operations preoperative care should include:
 - screening for relevant organisms
 - changing the antibiotic of choice for prophylaxis.

- Patients known to carry MRSA should have a course of eradication therapy prior to high risk surgery.

- C** **Intranasal mupirocin should be used prophylactically for adult patients undergoing surgery with a high risk of major morbidity who are identified with *S. aureus* or MRSA.**

- In the presence of known mupirocin resistance another topical preparation may be used.

- Where antibiotic prophylaxis is indicated, patients undergoing high risk surgery who are MRSA positive should receive a suitable antibiotic active against local strains of MRSA.

- A** **A glycopeptide should be considered for antibiotic prophylaxis in patients undergoing high risk surgery who are MRSA positive.**

Blood loss during surgery

- In the event of major intraoperative blood loss in adults (> 1,500 ml) additional dosage of prophylactic antibiotic should be considered after fluid replacement.

- In the event of major intraoperative blood loss in children (25 ml/kg) additional dosage of prophylactic antibiotic should be considered after fluid replacement.