

Galway: GAPP - Galway Antimicrobial Prescribing Policy / Guidelines (GAPP): Principles of Antibiotic Prophylaxis in Surgery

Principles of Antibiotic Prophylaxis in Surgery

Antibiotic prophylaxis in surgery is the use of antibiotics to prevent post-operative infection.

Are prophylactic antibiotics needed?

Prophylaxis is **recommended** for patients undergoing:

- **Clean-contaminated and contaminated/dirty surgical procedures** (see also note below regarding post-operative infection).
- **Clean** surgical procedures with **increased infection risk/devastating consequences** of infection such as lower limb vascular surgery, insertion of prosthetic material or on immunocompromised patients.

Choice of antibiotic

- The **choice of agent** will be determined by the **procedure** and the **likely potential pathogens**. These guidelines generally apply to procedures in patients admitted from the community.
- **Erythromycin should be avoided** - it is not a suitable agent for prophylaxis for a number of reasons including poor tissue penetration.

Timing of administration

- The aim of prophylaxis is to have maximum tissue antibiotic levels at the time of first incision.
- Therefore prophylaxis should be administered **within 60 minutes before incision/procedure** and is usually given in theatre at induction of anaesthesia.
- Note that fluoroquinolones (e.g. ciprofloxacin) require a longer time for infusion (60 minutes for 400mg IV). Therefore ciprofloxacin infusion should commence within 120 minutes before the surgical incision.

Duration of prophylaxis

- In most situations there is no value in continued prophylaxis after wound closure and prophylaxis is usually given as a **single dose** unless otherwise specified below.
- As per the [HSE National Clinical Programme in Surgery \(NCPS\) Surgical Antibiotic Prophylaxis Duration Position Paper](#)
- A duration of antibiotic prophylaxis of longer than 48 hours cannot be reasonably justified for any surgical procedure on the basis of current evidence or by consensus of expert opinion. (Note exception: management of open fractures)
- Antibiotic prophylaxis should not be continued beyond the time frames outlined on the basis that drains remain in place.

| Procedures requiring prophylaxis for >1 dose | |
|---|--|
| Procedure | Duration |
| Breast: Reconstructive Breast Surgery | Up to 24 hours |
| Cardiothoracic: CABG, Prosthetic Valve Surgery, Electronic Device Placement, Pulmonary Resection | 24 hours |
| ENT: Complex septo-rhinoplasty including grafts | 24 hours |
| Head & Neck | Up to 24 hours, unless extensive head & neck flap reconstruction |
| Maxillofacial: Open reduction and internal fixation of compound mandibular fractures, orthognathic surgery, intraoral bone grafting procedures. Facial plastic surgery with implant (consider prophylaxis). | Up to 24 hours |
| Orthopaedic: | |
| Orthopaedic implant surgery, ORIF closed fractures, Spinal surgery | 24 hours |
| Open fracture intervention/acute trauma | 3 to 5 days, maximum 24 hours post final wound closure |
| Debridement chronic bone infection | Discuss with Microbiology or Infectious Diseases |
| Plastic Surgery | Discuss with Microbiology or Infectious Diseases |
| Urology: Transrectal Prostate Biopsy | 2 doses ciprofloxacin (24 hours) |
| Vascular Surgery & Limb Amputation | 24 hours |



Additional intra-operative doses

Additional intra-operative doses of prophylactic antibiotic may be necessary in the following situations:

- Prolonged surgical procedures. Some antibiotics such as cephalosporins (e.g. CefUROXime) are short-acting and therefore an additional dose may be needed during surgery in procedures lasting longer than four hours. **Re-dosing is not recommended for antibiotics such as gentamicin, vancomycin or teicoplanin.**
- Blood loss/fluid replacement: In the event of major intra-operative blood loss (>1.5Litres) additional doses of prophylactic antibiotic should be considered **after fluid replacement** . Caution is needed in patients with renal impairment.

| Antibiotics requiring additional intra-operative doses | | |
|---|------|---|
| During procedures lasting over 4 hours or if major blood loss (>1.5L) | | |
| Antibiotic | Dose | Recommended redosing interval (from initiation of pre-op dose) in hrs * |
| Amoxicillin | 1g | 2 hrs |
| Cefuroxime | 1.5g | 4 hrs |
| Co-amoxiclav | 1.2g | 4 hrs (max 4 doses in 24 hrs) |
| Flucloxacillin | 1g | 4 hrs |

* The re-dosing interval may vary depending upon the half-life of the drug in question, and the patients underlying renal and hepatic function.

Obesity

The pharmacokinetics of drugs may be altered in obese patients, so dosage adjustment based on body weight may be warranted. Discuss with Pharmacy / Microbiology / Infectious Diseases if necessary.

Documenting antibiotic use

- Prophylactic antibiotics should be **prescribed** in the appropriate section of the patient's **drug chart**.
- Patients should ideally be **informed** prior to surgery, wherever possible, if they will need antibiotic prophylaxis, and afterwards if they have been given antibiotics during their operation.

Post-operative infection■

- **If infection is suspected** during surgery or post-operatively within 24 hours, appropriate microbiological samples should be sent. An agent that is appropriate for prophylaxis may not be the optimal agent for treatment of established infection and treatment guidelines should be consulted.

Complex prophylaxis issues■

- For patients with **complex clinical situations** e.g. those with resistant organisms, renal failure, immunocompromised or allergy to agents listed, please obtain advice from Microbiology or Infectious Diseases if necessary.
- Patients at risk for development of endocarditis may require modification of standard antimicrobial prophylaxis regimens. See [Prophylaxis of Infective Endocarditis](#) . Please discuss with Microbiology or Infectious Diseases if necessary.

MRSA

- For patients requiring specific surgical prophylaxis against MRSA see [Note Regarding Risk Factors for MRSA](#) ■

Multi-drug Resistant Organisms (MDRO) other than MRSA

- For patients colonised with an MDRO other than MRSA, discuss with Microbiology or Infectious Diseases. See note on [MDRO](#)