

Antimicrobial Prophylaxis for Surgical and Non-surgical Procedures

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Antimicrobial Prophylaxis for Surgical and Medical Procedures

Introduction

The goal of antibiotic prophylaxis in surgical patients is to reduce the incidence of surgical site infection and to use antibiotics in a manner that is supported by evidence of effectiveness.

It is important to emphasise that surgical antibiotic prophylaxis is an adjunct to, not a substitute for good surgical technique. Antibiotic prophylaxis should be regarded as ONE component of an effective policy for the control of healthcare associated infection.

This policy also covers a variety of medical procedures, for which the same general principles apply.

Even single doses of antibiotics can result in *C. difficile* infection so prophylaxis should only be given when benefit has been demonstrated

Administration of prophylactic antibiotics:

- Intravenous prophylactic antibiotic should be given within 30 minutes before the skin is incised or the procedure undertaken
- A single standard therapeutic dose of antibiotic is usually sufficient for prophylaxis under most circumstances
- In the event of major intra-operative blood loss in adults (>1,500 ml) an additional dose of prophylactic antibiotic should be considered after fluid replacement
- In the event of major intra-operative blood loss in children (25 ml/kg) an additional dose of prophylactic antibiotic should be considered after fluid replacement
- An additional intra-operative dose of antibiotic is recommended for operations longer than four hours

Other comments

- In patients known to be colonised with MRSA - *replace with Teicoplanin 400mg or add Teicoplanin 400mg IV
- If MRSA results are not available and there is a suspicion that a patient is high risk for MRSA – discuss with a Microbiologist
- For Gentamicin dose: if weight is unknown then use 120mg

Gentamicin dose calculation (IV) for prophylaxis

| Weight | Dose |
|------------|--------|
| <49 kg | 80 mg |
| 50 – 69 kg | 120 mg |
| 70 – 89 kg | 160 mg |
| >90 kg | 200 mg |

CONTENTS

| Section header | Page |
|--|---------|
| Abdominal Surgery | 4 - 5 |
| Urological Surgery | 6 - 7 |
| Vascular Surgery | 8 |
| Breast Surgery | 9 |
| Obstetrics & Gynaecology | 10 - 11 |
| Miscellaneous procedures | 12 - 13 |

| ABDOMINAL SURGERY | | |
|--------------------------------|---|--|
| Procedure | Antibiotics | Comments |
| Small/Large bowel resection | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Cholecystectomy (open) | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Cholecystectomy (laparoscopic) | Not routinely recommended <i>Consider for high risk patients:-</i> Metronidazole 500mg IV+ gentamicin 2mg/kg IV | High risk:- bile spillage <ul style="list-style-type: none"> • Acute cholecystitis/pancreatitis • Insertion of prosthetic device • Conversion to laparotomy • Intraoperative cholangiogram |
| Gastric-oesophageal surgery | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Gastric bypass | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Appendicectomy | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |

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|---|-----------------|--|
| Hernia Repair (inguinal/femoral/incisional/ with or without mesh) | Not recommended | See SIGN guidance |
| Clean general surgical procedures | Not recommended | Includes varicose vein repair and thyroidectomy |
| Splenectomy | Not recommended | For long term prophylaxis and vaccine refer to Trust guidance - <i>Link</i> |

| UROLOGY SURGERY | | |
|--|---|---|
| Procedure | Antibiotics | Comments |
| <ul style="list-style-type: none"> • Transurethral resection of prostate • Transurethral resection of bladder tumours • Transurethral prostate biopsy • Shock wave lithotripsy • Ureterostomy • Percutaneous removal of renal stones | Gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Transrectal prostatic biopsy | Ciprofloxacin 750mg po + metronidazole 400mg po | Take 60 minutes before procedure |
| Radical cystectomy | Metronidazole 500mg IV + gentamicin 2mg/kg IV | |
| Reconstructive Surgery (Urethral and Bladder) | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| Laparoscopic Surgery | Metronidazole 500mg IV + gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes |
| <ul style="list-style-type: none"> • Inguino-scrotal surgery (circumcision, dorsal slit, hydrocele repair, inguinal orchidectomy) • Cystoscopy • Nephrectomy | Not required | If evidence of UTI at time of nephrectomy or cystoscopy antibiotics may be required |

| | | |
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| Prosthesis insertion | Co-amoxiclav 1.2g IV | Penicillin-allergy (rash) - cefuroxime 1.5g IV+ metronidazole 500mg IV Penicillin anaphylaxis – consult Microbiologist |
|----------------------|----------------------|--|

| VASCULAR SURGERY | | |
|-----------------------|--|--|
| Procedure | Antibiotics | Comments |
| Vascular surgery | *Co-amoxiclav 1.2g IV + gentamicin 2mg/kg IV | A further 2 doses post-op of co-amoxiclav may be given at the discretion of the vascular surgeon Penicillin allergy: teicoplanin 400mg IV instead of co-amoxiclav |
| Lower limb amputation | *Co-amoxiclav 1.2g IV tds for 24 hrs | If any suspicion of gas gangrene then post op treatment up to 5 days is recommended. Penicillin-allergy (rash): Cefuroxime 1.5g IV + metronidazole 500mg IV Penicillin anaphylaxis – consult Microbiologist |

| BREAST SURGERY | | |
|---------------------------------------|--|--|
| Procedure | Antibiotics | Comments |
| Excision biopsy | Not recommended | |
| Total duct excision | *Flucloxacillin 1g IV | Penicillin allergy: teicoplanin 400mg IV |
| Breast cancer surgery without implant | *Flucloxacillin 1g IV | Gentamicin is given by slow injection over 3-5 minutes |
| Breast cancer surgery with implant | *Flucloxacillin 1g IV + gentamicin 2mg/kg IV | |

OBSTETRICS AND GYNAECOLOGICAL SURGERY

| Procedure | Antibiotics | Comments |
|---|---|---|
| <ul style="list-style-type: none"> Hysterectomy (vaginal, abdominal, laparoscopic) Vaginal pelvic floor repairs Urogynaecological operations Other major gynaecological surgery | Gentamicin 2mg/kg IV + metronidazole 500mg IV | Gentamicin is given by slow injection over 3-5 minutes |
| <ul style="list-style-type: none"> 3rd/4th perineal tear repairs Manual removal of placenta | Co-amoxiclav 1.2g | <p>Penicillin allergy (rash) – cefuroxime 1.5g +metronidazole 500mg IV</p> <p>Penicillin anaphylaxis – consult Microbiologist</p> |
| <ul style="list-style-type: none"> Diagnostic or other operative laparoscopy Hysteroscopy Assisted operative vaginal delivery Insertion of Intrauterine Contraceptive Device (IUCD) Endometrial Ablation or Biopsy Hysterosalpingography and Laparoscopy and Dye Test Evacuation of Incomplete Miscarriage Exploratory Laparotomy | Antibiotic prophylaxis NOT routinely recommended | |

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|-----------------------------------|---|--|
| Surgical termination of pregnancy | Metronidazole 1g PR or 400mg PO AND azithromycin 1g PO (at the time of abortion) | If allergic or intolerant to either of these, please discuss with microbiologist |
| Caesarean section | Cefuroxime 1.5g IV + metronidazole 500mg IV 15-20 minutes before skin incision. | Penicillin anaphylaxis: Clindamycin 600mg IV + gentamicin 2mg/kg IV |

| MISCELLANEOUS/MEDICAL PROCEDURES | | |
|---|---|---|
| Procedure | Antibiotics | Comments |
| Cardiac Pacemaker Insertion | Flucloxacillin* 1g + Gentamicin 2mg/kg IV | Gentamicin is given by slow injection over 3-5 minutes Penicillin allergy –replace flucloxacillin with teicoplanin 400mg IV |
| PEG Insertion | Co-amoxiclav* 1.2g IV | Penicillin-allergy (rash) - cefuroxime 1.5g IV Penicillin anaphylaxis – consult Microbiologist |
| Endoscopic Retrograde Cholangiopancreatography (ERCP) | Ciprofloxacin 750mg po stat | Up to 3 further doses may be given (48 hours total) if obstruction not relieved. Note: simple diagnostic ERCP does not require prophylaxis |
| Intravenous Catheter Insertion | None required | |
| Thoracoscopy | None required | |
| Urinary catheter insertion or removal | None required routinely | Consider for patients with history of symptomatic UTI after catheter change or who experience trauma during catheterisation (gentamicin 2mg/kg by slow injection over 3-5 mins) |

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|----------------------------------|--|--|
| Nasal pack insertion (epistaxis) | Flucloxacillin 500mg qds may be given until pack removal (max 3-5 days) | There is no clear evidence for this practice |
| Upper GI bleed (varices) | Ciprofloxacin 500 mg bd IV/PO 7 days | |
| Orthopaedic Surgery | <i>Refer to Orthopaedic guidelines</i> | |

References

Scottish Intercollegiate Guidelines Network (SIGN): *Antibiotic Prophylaxis in Surgery*, July 2008, Updated April 2014

NICE clinical guideline CG141: *Acute upper GI bleeding in over 16s*. June 2012. Updated August 2016

NICE clinical guideline: *Urinary tract infection (catheter-associated): antimicrobial prescribing*. 23rd November 2018