



<b>Title</b>	<b>Adult Surgical (and Other Interventional) Prophylaxis Guidelines</b>
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**Uncontrolled when printed**

## Adult Surgical (and Other Interventional) Prophylaxis Guidelines

### Summary of changes in this version compared to previous version

- Advice regarding modifications with documented carriage of resistant gram negatives.
- Introduction of height based criteria for gentamicin dosing in surgical prophylaxis.
- Introduction of streptococcal and enterococcal cover in GI and gynaecological surgery prophylaxis.
- Switch to cefuroxime as prophylaxis for arthroplasty procedures other than total joint replacement.
- Change in dosage recommendation for teicoplanin in orthopaedic prophylaxis.

The goal of surgical prophylaxis is to reduce the incidence of surgical site infection (SSI), while reducing the risk of adverse effects from the antibiotics used.

All IV doses should be given within 60 minutes prior to skin incision and as close to time of incision as practically possible.

**Single preoperative doses only to be prescribed unless otherwise stated.**

**Aim to give indicated prophylaxis before pre-operative urinary catheterisation where this is performed.**

**Further intraoperative doses are required in prolonged procedures or with blood loss as below**

Blood loss > 1500 ml

Re-dose following fluid replacement giving same dose for all agents *except*

- Gentamicin\* – give half initial prophylactic dose
- teicoplanin – give half original dose if  $\geq 1.5L$  blood loss within first hour of operation
- clindamycin – give half original dose

Prolonged operation

- 4 hours - re-dose amoxicillin, cefuroxime, clindamycin, co-amoxiclav, flucloxacillin
- 8 hours – re-dose amoxicillin, cefuroxime, clarithromycin, clindamycin, co-amoxiclav, flucloxacillin, metronidazole **and**, if eGFR > 60 ml/min gentamicin\* (at full prophylactic dose)

\*For complex patients, discuss with microbiology in advance to ensure re-dosing is safe and appropriate

Contaminated or dirty, infected wounds require treatment courses not prophylaxis

**Pregnant patients:** Gentamicin should be avoided in pregnancy. Cefuroxime is suitable alternative.

### Modifications related to carriage/colonisation with resistant bacteria

MRSA carriage

- Consider preoperative or perioperative decolonisation
- If prophylaxis indicated add **Teicoplanin** IV (400mg or 800mg/600mg for orthopaedic procedures) if not already included in regimen

### Gentamicin resistant gram negatives

- Review microbiology results for available susceptibility information and discuss with microbiologist when feasible
- When prophylaxis is indicated and susceptibility information is unavailable consider use of meropenem as prophylactic agent.

### Modifications related to allergy or other contra-indication to prophylactic antibiotics

Alternatives are generally provided for patients with penicillin allergy. For other circumstances when recommended agents cannot be given please contact microbiology or pharmacy for advice. Omitting agents will affect the cover offered.

### Gentamicin dosing in surgical prophylaxis (*based on GGC guideline*)

Prophylactic gentamicin dosing is based on patient height and approximates to 3mg/kg ideal body weight capped at 300mg. This allows bolus administration in the anaesthetic room, as detailed in the table below.

<b>Gentamicin surgical prophylaxis dosing table</b>			
Avoid gentamicin if eGFR <20 or renal transplant : seek advice on alternative from microbiology			
Height ranges (Feet and inches)	Height ranges (cm)	Gentamicin dose (mg)	
		Males	Females
4' 8" – 4' 10"	142 - 147	160	140
> 4' 10 – 5' 3"	> 147 – 160	180	160
> 5' 3" – 5' 10"	> 160 - 178	240	200
> 5' 10" – 6' 2"	>178 - 188	300	260
> 6' 2"	> 188	300	300

<b>General Surgery</b>	
<b>Appendectomy</b>	<b>Amoxicillin 1g IV (or teicoplanin 400mg IV if beta-lactam allergy)</b> <b>plus</b> <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above) <b>plus</b> <b>Metronidazole 500mg IV</b>
<b>Colorectal surgery</b>	<b>Amoxicillin 1g IV (or teicoplanin 400mg IV if beta-lactam allergy)</b> <b>plus</b> <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above) <b>plus</b> <b>Metronidazole 500mg IV</b>
<b>Upper GI Surgery</b>	<b>Amoxicillin 1g IV (or teicoplanin 400mg IV if beta-lactam allergy)</b> <b>plus</b> <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above) <b>plus</b> <b>Metronidazole 500mg IV</b>

<p><b>Open cholecystectomy</b></p>	<p><b>Amoxicillin 1g IV</b> (or <b>teicoplanin 400mg IV</b> if beta-lactam allergy)  <b>plus</b>  <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above)  <b>plus</b>  <b>Metronidazole 500mg IV</b></p>
<p><b>Laparoscopic cholecystectomy</b></p>	<p><b>Prophylaxis not recommended unless high risk</b>  intraoperative cholangiogram, bile spillage, conversion to laparotomy, acute cholecystitis/pancreatitis, jaundice, immunosuppression, insertion of prosthetic devices, pregnancy (if pregnant use cefuroxime prophylaxis)  <b>Amoxicillin 1g IV</b> (or <b>teicoplanin 400mg IV</b> if beta-lactam allergy)  <b>plus</b>  <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above)  <b>plus</b>  <b>Metronidazole 500mg IV</b></p>
<p><b>Endoscopic retrograde Cholangiopancreatography (ERCP)</b></p>	<p><b>Prophylaxis not recommended unless high risk</b>  pancreatic pseudocyst, immunosuppression, incomplete biliary drainage  Ciprofloxacin 500mg orally prior to procedure or if not given Gentamicin according to gentamicin surgical prophylaxis table above</p>
<p><b>Breast surgery</b>  <b>Prophylaxis should be considered for procedures for breast cancer especially if extending towards the axilla.</b>  <b>Prophylaxis should be considered for breast re-shaping procedures.</b>  <b>Prophylaxis is advised for breast surgery involving the insertion of implants.</b></p>	<p><b>Flucloxacillin 1g IV</b>  or, if penicillin allergy,  <b>Teicoplanin 400 mg IV</b></p>
<p><b>Hernia repair with or without mesh</b></p>	<p><b>Prophylaxis not routinely recommended</b>  Consider in patients with mesh insertion if: obesity, diabetes, or other risk factors for SSI)  <b>Teicoplanin 400 mg IV</b>  <b>plus</b>  <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above)  <b>plus</b>  <b>Metronidazole 500mg IV</b></p>
<p><b>Haemorrhoidectomy, including stapled haemorrhoidopexy</b></p>	<p><b>Amoxicillin 1g IV</b> (or <b>teicoplanin 400mg IV</b> if beta-lactam allergy)  <b>plus</b>  <b>Gentamicin IV</b> (see gentamicin surgical prophylaxis dosing table above)  <b>plus</b>  <b>Metronidazole 500mg IV</b></p>

Urology	
Transrectal prostate biopsy	<b>Ciprofloxacin</b> 500mg oral 60 minutes before procedure
Transurethral resection of prostate	<b>Gentamicin</b> 160mg IV
TURBT (Local practice)	<b>Gentamicin</b> 160mg IV

Obstetrics and Gynaecology	
Caesarean Section	<b>Cefuroxime</b> 1.5g IV + <b>metronidazole</b> 500mg IV.  Or, in immediate (type 1) beta-lactam sensitivity <b>Clindamycin</b> 900mg IV as a single agent
Gynaecology majors, including PFRs	<b>Amoxicillin</b> 1g IV (or <b>teicoplanin</b> 400mg IV if beta-lactam allergy) <b>plus</b> <b>Gentamicin</b> IV (see gentamicin surgical prophylaxis dosing table above) <b>plus</b> <b>Metronidazole</b> 500mg IV
Termination of pregnancy	<b>Metronidazole</b> 1g oral or PR 2 hours before surgery followed by <b>Azithromycin</b> 1g oral single dose ( <i>unless pre-operative screening has ruled out chlamydial infection</i> ) with administration of Misoprostol
Transvaginal tapes	<b>Amoxicillin</b> 1g IV (or <b>teicoplanin</b> 400mg IV if beta-lactam allergy) <b>plus</b> <b>Gentamicin</b> IV (see gentamicin surgical prophylaxis dosing table above) <b>plus</b> <b>Metronidazole</b> 500mg IV

Orthopaedic Surgery	
Total Joint Arthroplasty (antibiotic loaded cement is also recommended in addition to IV antibiotics)	<b>Cefuroxime</b> 1.5g IV at induction as a single agent, followed by 2 doses of 750mg IV at 8 hourly intervals  <b>Or</b> , in immediate (type 1) beta-lactam sensitivity  <b>Teicoplanin</b> IV 800mg (600mg if weight ≤ 60kg) single dose <b>plus</b> <b>Gentamicin</b> IV according to gentamicin surgical prophylaxis table above) single dose
Other arthroplasty procedures	<b>Cefuroxime</b> 1.5g IV as a single agent  <b>Or</b> , in immediate (type 1) beta-lactam sensitivity

<p><b>All intramedullary nails</b></p> <p><b>Other internal fixations</b></p>	<p><b>Teicoplanin</b> IV 800mg (600mg if weight <math>\leq</math> 60kg) single dose</p> <p><b>plus</b></p> <p><b>Gentamicin</b> IV according to gentamicin surgical prophylaxis table above, single dose</p>
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<b>Oral Surgery</b>	
<p><b>Wisdom teeth extraction</b></p> <p><b>High risk patients (at discretion of oral surgeon)</b></p>	<p>Preferred choice: <b>Co-amoxiclav</b> 1.2g IV</p> <p>Alternative: clindamycin 600mg IV</p>

<b>Gastrointestinal Endoscopy</b>	
<p><b>PEG insertion</b></p>	<p><b>Co-amoxiclav</b> 1.2g IV</p> <p>Or, in penicillin allergy, <b>teicoplanin</b> 400mg IV</p>
<p><b>Variceal banding in presence of ascites</b></p>	<p><b>Ceftriaxone</b> 2g as a single agent</p> <p>or in immediate (type 1 ) beta-lactam sensitivity</p> <p><b>Teicoplanin</b> 6mg/kg</p> <p><b>plus</b></p> <p><b>gentamicin</b> IV (see gentamicin surgical prophylaxis dosing table above)</p>
<p><b>Variceal bleeding</b></p>	<p><b>Ceftriaxone</b> 2g as a single agent daily for 5 days</p> <p>or in immediate (type 1 ) beta-lactam sensitivity</p> <p><b>Teicoplanin</b> 6mg/kg mg twice daily for 3 doses then 6 mg/kg daily</p> <p><b>plus</b></p> <p><b>gentamicin</b> IV (divided dose regimen see Appendix i )</p>

Scottish Intercollegiate Guidelines Network Surgical Prophylaxis Guidelines  
<http://www.sign.ac.uk/pdf/sign104.pdf>

Scottish Antimicrobial Prescribing Group. Good practice recommendations for surgical prophylaxis 2014.  
<http://www.scottishmedicines.org>

SAPG recommendations for re-dosing antibiotics for surgical prophylaxis  
<http://www.scottishmedicines.org>

British Society of Gastroenterology. Antibiotic prophylaxis in gastrointestinal endoscopy.  
 Gut 2009; 58: 869-880.

Antibiotic prophylaxis in surgery, general principles NHS GGC