

# ANTIBIOTIC PROPHYLAXIS IN GENERAL SURGERY

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The aim of surgical prophylaxis is to reduce rates of surgical site and healthcare-associated infections and so reduce surgical morbidity and mortality. There is however growing evidence that aspects of prescribing practice may themselves be associated with health-care associated infections, notably *Clostridioides difficile* infection (CDI). The [Scottish Antimicrobial Prescribing Group](#) (SAPG), along with the Scottish Government, is monitoring surgical prophylaxis in order to reduce the rates of CDI and resistance. SIGN guideline 104 (published in 2008 and updated 2014) has outlined which surgical procedures require prophylactic antibiotics based on a review of the available evidence. Principles of prophylaxis have also been outlined, including timing and duration of antibiotic administration. In conjunction with the surgical specialties within NHS Tayside the Antimicrobial Management Group has undertaken to review local prophylaxis policy and to formulate a uniform policy.

## Principles of Antibiotic Prophylaxis Policy

1. **Indication for prophylaxis** should comply with SIGN 104 guideline i.e. when 'highly recommended', 'recommended' or 'considered' within guideline.
2. **Timing of antibiotic(s):**
  - Optimum timing is intravenous dose given or infusion completed  $\leq$  60 minutes prior to skin incision
  - Sub-optimal if  $>$ 1 hour prior to skin incision or post-skin incision
3. **Recording of antibiotic** prescription in 'once only' section of medicine chart to avoid multiple dosing
4. **Frequency of administration** should be single dose only unless:
  - $>$  1.5 litres intra-operative blood loss - re-dose following fluid replacement (see administration guidance table)
  - operation prolonged (see administration guidance table)
  - specifically stated in following guidelines
5. **Documentation in medical notes** of reason for antibiotic administration beyond single dose or state intention for antibiotic treatment course
6. **Choice of agent** should:
  - Avoid cephalosporins, clindamycin, quinolones and co-amoxiclav wherever possible
  - Use narrow spectrum agents when possible to minimise impact on resistance and CDI
  - Take into account local resistance patterns
  - Provision of alternatives for beta-lactam allergy
7. **De-colonisation therapy/MRSA positive**

If a patient is identified as MRSA positive from screening swabs within 3 weeks of anticipated date of elective surgery then a decolonisation program should be started. See [HPS Decolonisation Policy](#). The decolonisation regimen should also be restarted the day they come into hospital for 5 days to reduce the microbial load perioperatively. For surgical prophylaxis for primary operations vancomycin infusion should be added to the regime recommended in the table below (except for breast surgery where it would be used as a replacement). If they have an MRSA infection prior to elective surgery the approach is the same as for any other infection.
8. **Complex individual prophylaxis** issues should be discussed with Microbiology or Infectious Diseases pre-operatively and recorded in medical notes
9. **Compliance with local policy** is required and monitored by NHS Tayside. Any deviation from policy must be recorded in the appropriate medical records.

For details of antibiotic administration see last page.

Type of Surgery	Procedure	SIGN 104 Recommendation	Antibiotic(s)	Comments (if patient is MRSA positive refer to section 7 above)
Breast Surgery	Breast Cancer Surgery Breast Reshaping Procedures	Locally 'Recommended'	Flucloxacillin IV	If penicillin allergic use Clindamycin IV
	Breast Surgery with Implant (reconstructive or aesthetic)	'Recommended'	Flucloxacillin IV	If penicillin allergic use Clindamycin IV
Vascular Surgery				See separate <a href="#">Vascular Unit Policy</a>
Head and Neck Surgery	Thyroidectomy	'Not recommended'		Clean, benign surgery
Upper Gastro-intestinal	Oesophageal Surgery Stomach and Duodenal Surgery Gastric Bypass Surgery Small Intestine Surgery	'Recommended'	Gentamicin IV + Metronidazole IV	<b>If patient is receiving dialysis, an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
Hepatobiliary	Bile Duct Surgery Pancreatic Surgery Liver Surgery Gall Bladder Surgery (open)	'Recommended'	Gentamicin IV + Metronidazole IV	<b>If patient is receiving dialysis, has an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
	Gall Bladder Surgery (laparoscopic)	'Not recommended' but should be 'considered' in 'high risk' patients	If required use: Gentamicin IV + Metronidazole IV	'high risk': intraoperative cholangiogram, bile spillage, conversion to laparotomy, acute cholecystitis/pancreatitis, jaundice, pregnancy, immunosuppression, insertion of prosthetic devices. <b>If patient is receiving dialysis, has an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
Lower Gastro-intestinal	Appendectomy Colorectal Surgery	'Highly recommended'	Gentamicin IV + Metronidazole IV	<b>If patient is receiving dialysis, has an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
Abdomen	Hernia repair-groin <ul style="list-style-type: none"> <li>Inguinal/femoral with or without mesh</li> <li>Laparoscopic with or without mesh</li> </ul> Hernia repair (incisional with or without mesh)	'Not recommended'		
	Open/laparoscopic surgery with mesh (e.g. gastric band or rectoplexy)	'Not recommended' but should be 'considered' in 'high risk' patients	If required use: Gentamicin IV + Metronidazole IV	'high risk': pregnancy, immunosuppression, insertion of prosthetic devices. <b>If patient is receiving dialysis, has an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
	Diagnostic endoscopic procedures	'Not recommended'		
	Therapeutic endoscopic procedures (ERCP)	'Not recommended' but should be 'considered' in 'high risk' patients	If required use: Gentamicin IV + Metronidazole IV	'high risk': pregnancy, immunosuppression, insertion of prosthetic devices. <b>If patient is receiving dialysis, has an eGFR &lt;30ml/min, Cr &gt;350 or acute kidney injury consider using co-amoxiclav instead.</b> If patient has any renal issues, as above, and penicillin allergy please seek ID or Microbiology advice on choice of antibiotic prophylaxis.
Spleen	Splenectomy	'Not recommended'		

#### IV Antibiotic Administration Guidance:

Antibiotic	Dose	Administration	<u>Prolonged surgery</u> Time from administration of initial dose	>1.5L <u>blood loss</u> redose after fluid replacement
Metronidazole	BMI <30 500mg BMI ≥30 1g	Infusion over 20 minutes <b>Infusion over 40 minutes (at least 500mg to be infused before knife to skin)</b>	Repeat original dose after 8 hours	500mg
Gentamicin*	4mg/kg Use actual body weight (ABW) or ideal body weight (IBW) if ABW >20% over IBW IBW = (males: 50kg, females: 45.5kg) +0.9kg for every cm >150cm	Bolus over at least 5 mins or infusion Can also be added to metronidazole infusion bag	Repeat original dose ONLY if surgery longer than 8 hours and eGFR >60ml/min	Give half original dose
Flucloxacillin	1g	Bolus over 3-5 minutes	1g to be repeated every 4 hours	1g
Clindamycin	600mg	Infusion over 20 minutes	600mg to be repeated every 4 hours	300mg
Co-amoxiclav	1.2g	Bolus over 3-5 minutes	1.2g to be repeated every 4 hours	1.2g
Vancomycin	1g	Infusion over 100-120 minutes in 250ml sodium chloride 0.9%	Redose 1g after 12 hours	500mg

\* For complex patients discuss with pharmacy or ID or microbiology in advance to ensure re-dosing is safe and appropriate.

#### References:

- SAPG Good Practice Recommendations for Surgical and Procedural Antibiotic Prophylaxis in Adults in NHS Scotland. <https://www.sapg.scot/media/4109/good-practice-recommendations-for-surgical-and-procedural-antibiotic-prophylaxis-in-adults-in-nhs-scotland.pdf> [Accessed May 2019]
- SAPG Recommendations for Re-dosing Antibiotics for Surgical Prophylaxis. <https://www.sapg.scot/media/4105/good-practice-recommendations-for-re-dosing-antibiotics-for-surgical-prophylaxis.pdf> [Accessed May 2019]