ADULT ANTIBIOTIC PROPHYLAXIS IN GASTROINTESTINAL SURGERY

General Principles of Prescribing for Surgical Prophylaxis

- Indication for prophylaxis has been based on the Scottish Antimicrobial Prescribing Group (SAPG) Good Practice Recommendations for Surgical Prophylaxis (2022) and guided by national and local practice.
- Choice of agent:
  - Adhere to recommended agent in table below where possible.
  - Recommendations restrict the use of cephalosporins, clindamycin, quinolones and co-amoxiclav and use narrow spectrum agents where possible.
  - Take recent culture results/antibiotic therapy and additional patient risk factors into account eg. morbid obesity, multiple previous surgeries, prosthetic material, diabetes.
    Discuss with Infection Specialist in a timely manner prior to surgery if multidrug resistance eg. Carbapenemase producing enterobacteriaceae (CPE) isolated.
  - Check allergy status of patient including nature of allergy prior to prescribing.
  - If fluoroquinolones are prescribed, see MHRA guidance on Clinical Guidelines webpage.
- Recording of antibiotic as 'STAT' on HEPMA and on Anaesthetic Record Sheet.
- Timing of antibiotic:
  - Optimum timing of IV antibiotics is ≤ 60 minutes prior to skin incision, usually at induction of anaesthesia.
  - Antimicrobial cover may be sub-optimal if given > 1 hour prior to skin incision or post skin incision.
- Frequency of administration should be single dose only unless:
  - Operation Prolonged (see re-dosing guidance table).
  - > 1.5 litre intra-operative blood loss – Re-dose following fluid replacement (see re-dosing guidance table).
  - Specifically stated in following guideline.
  - Document in the medical notes the indication for antibiotic administration beyond 1st dose.
- Decolonisation therapy should be used prior to elective surgery if patient MRSA positive and antimicrobial prophylaxis should include cover for MRSA.
  - See NHSL Policy for management of patients colonised or infected with MRSA.

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Recommended Agents in Gastrointestinal Surgery

Dosing specified based on CrCL >60ml/min; if renal impairment consult individual drug product literature.

Procedure	1st Choice	MRSA positive or True/ Severe penicillin allergy	Comments
Oesophageal, stomach, duodenal, colorectal and small intestine, appendicectomy, gallbladder (open), pancreatic surgery, bile duct surgery, gastric bypass	Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Amoxicillin 1g IV	Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	Recommended. Highly recommended in Colorectal and appendicectomy.
Gallbladder surgery (laparoscopic)	If indicated: Gentamicin IV (see dosing table*) + Metronidazole 500mg IV	If indicated: Gentamicin IV (see dosing table*) + Metronidazole 500mg IV	Not routinely recommended. Consider in cholangiogram, bile spillage, conversion to open, acute cholecystitis or pancreatitis, jaundice, pregnancy, immunosuppression or insertion of prosthesis.
Hernia repair (inguinal, femoral, laparoscopic or incisional), Open/ laparoscopic surgery with mesh eg. gastric band, Rectoplexy	Not routinely recommended. Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	Not routinely recommended. Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	Consider in patients with mesh if: obesity, diabetes, or other risk factors for SSI
Splenectomy	If indicated: Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Amoxicillin 1g IV	If indicated: Gentamicin IV (see dosing table*) + Metronidazole 500mg IV + Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	Not routinely recommended. Consider in immunosuppression. Remember post splenectomy prophylaxis (see NHSL splenectomy protocol).
ERCP (therapeutic)	If indicated: Gentamicin IV (see dosing table*)	If indicated: Gentamicin IV (see dosing table*)	Should be considered in pancreatic pseudocyst, immunosuppression, incomplete biliary drainage, sclerosing cholangitis and cholangiocarcinoma.

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Procedure	1st Choice	MRSA positive or True/ Severe penicillin allergy	Comments
Variceal banding/injection (acute)	Piperacillin/ Tazobactam (Tazocin) 4.5g IV 8 hourly	Ciprofloxacin **500mg Oral** / *400mg IV* 12 hourly + Vancomycin IV (see NHSL vancomycin calculator and guidance for dosing)	Continue for 48 hours after cessation of bleeding. Consider IV to oral switch.
Diagnostic endoscopy	Not routine	Not routine	Not recommended
PEG tube insertion	Co-amoxiclav 1.2g IV	*In penicillin allergy:* Co-trimoxazole 960mg IV (480mg if CrCL <30mL/min) *Alternatively,* Co-trimoxazole 960mg suspension (using 480mg/5mL suspension) to be given through PEG tube immediately after insertion.	Should be considered in high risk patients. Measure 10ml of co-trimoxazole 480mg/5mL suspension and mix with an equal volume of sterile water before administration.

- If treatment course required after **teicoplanin** prophylaxis convert to vancomycin (dose according to NHSL treatment protocol with 1st dose 12 hours after teicoplanin).
- Clinicians should be aware of potential allergic reactions to teicoplanin.

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IV Antibiotic Administration and Re-Dosing Guidance

Antibiotics should be given as a bolus injection where possible.
All re-dosing guidance based on pre-op Creatinine Clearance (CrCL) >60mL/min; if renal impairment present consult individual product literature

Antibiotic	Dose	Administration	Prolonged surgery Procedure duration (from 1st antibiotic dose)		>1.5L blood loss – Re-dose after fluid replacement
			Over 4 hours	Over 8 hours	
Gentamicin	See dosing table*	**IV** Can be given undiluted, or diluted to a convenient volume with sodium chloride 0.9% or glucose 5% to aid slow administration. Give by slow IV injection over at least 3 minutes via large peripheral vein or central line.	Not required	**Do not re-dose with gentamicin.** Alternatives to consider: Co-amoxiclav 1.2g IV *Or in penicillin allergy:* Ciprofloxacin 400mg IV	Give half original dose of gentamicin, Or consider, Co-amoxiclav 1.2g IV *Or if penicillin allergy:* Ciprofloxacin 400 mg IV
Amoxicillin	1g	**IV** Reconstitute with 20ml of water for injection and give by slow IV injection over 3-4 minutes.	Repeat 1g	Repeat 1g (again)	Repeat 1g
Co-amoxiclav	1.2g	**IV** Re-constitute 1.2g vial with 20ml of water for injection and give by slow IV injection over 3-4 minutes.	Repeat 1.2g	Repeat 1.2g (again)	Repeat 1.2g
Co-trimoxazole	960mg	**IV** Dilute each 480mg/5ml vial in 125ml sodium chloride 0.9% and give by IV infusion over 60 minutes.	Not required	Re-dose 480mg	Re-dose 480mg
Metronidazole	500mg	**IV** Already diluted. Give by IV infusion over at least 20 minutes.	Not required	Repeat 500mg	Repeat 500mg
Teicoplanin	400mg if patient weight <65kg or 800mg ≥65kg	**IV** Re-constitute slowly with 3.14ml ampoule of water for injection provided and roll gently until dissolved. If foamy, stand for 15 minutes until foam subsides then give EACH vial by slow IV injection over 3-5 minutes.	Do not re-dose (long half-life)	Do not re-dose (long half-life)	Give half original dose if >1.5L blood loss within first hour of operation

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*Dosing Table for Gentamicin Prophylaxis

Review medication charts and HEPMA prior to prescribing and administration of gentamicin.
Avoid if patient has received gentamicin within previous 24 hours.

In normal renal function:
Use the patient's **actual body weight and height** to calculate the gentamicin dose, using the table below.
The gentamicin dosing table is based on approximately 5mg/kg actual body weight/ adjusted body weight (maximum dose 400mg).

In renal impairment; Creatinine Clearance (CrCL) <20mL/min:
Give HALF of dose recommended in table below, rounded to nearest 20mg (approximately 2.5mg/kg, maximum dose 180mg).

Height \ Weight		30-39.9 kg	40-49.9 kg	50-59.9 kg	60-69.9 kg	70-79.9 kg	80-89.9 kg	90-99.9 kg	100-109.9 kg	110-119.9 kg	120-129.9 kg	> 130 kg
4'8-4'10	**142-149 cm**	180 mg	220 mg	240 mg	260 mg	280 mg	300 mg	320 mg	340 mg	360 mg	380 mg	400 mg
4'11-5'3	**150-162 cm**	180 mg	220 mg	260 mg	280 mg	300 mg	320 mg	340 mg	360 mg	380 mg	400 mg	400 mg
5'4-5'10	**163-179 cm**	180 mg	220 mg	280 mg	320 mg	340 mg	360 mg	380 mg	380 mg	400 mg	400 mg	400 mg
5'11-6'2	**180-189 cm**		220 mg	280 mg	320 mg	360 mg	380 mg	400 mg	400 mg	400 mg	400 mg	400 mg
6'3-6'8	**190-203 cm**			280 mg	320 mg	380 mg	400 mg	400 mg	400 mg	400 mg	400 mg	400 mg

If subsequent treatment using gentamicin is required post-operatively, measure gentamicin concentration 6-14 hours post theatre dose. Use the gentamicin treatment guidance to decide on course of action before administering a further dose. If sampling window missed, measure gentamicin concentration 20-24 hours post-theatre dose and ensure level <1mg/L before administering a further dose. For gentamicin treatment dosing, refer to NHS Lanarkshire's gentamicin treatment guidance and online calculators. Discuss with pharmacy if further advice is required.

References

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