

ADULT ANTIBIOTIC PROPHYLAXIS IN UROLOGICAL 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 Urological Surgery

Procedure	1 st Choice	True/ Severe Penicillin allergy	MRSA positive	Comments
Transrectal prostatic biopsy	Gentamicin IV (see dosing table*) OR Ciprofloxacin 750mg orally (60 min prior to procedure)	Gentamicin IV (see dosing table*) OR Ciprofloxacin 750mg orally (60 min prior to procedure)	Gentamicin IV (see dosing table*)	Recommended. <i>Use rectal cleansing with povidone-iodine prior to transrectal prostate biopsy (European Association of Urology guidance).</i>
Transperineal biopsy	If indicated: Gentamicin IV (see dosing table*)	If indicated: Gentamicin IV (see dosing table*)	If indicated: Gentamicin IV (see dosing table*)	Use routine surgical disinfection of the perineal skin for transperineal biopsy. <i>Two systematic reviews including non-RCTs and two RCTs describe comparable rates of post-transperineal biopsy infection in patients with and without antibiotic prophylaxis (European Association of Urology guidance).</i>
Transurethral resection of the prostate (TURP)	Gentamicin IV (see dosing table*) OR Ciprofloxacin 750mg orally (60 min prior to procedure)	Gentamicin IV (see dosing table*) OR Ciprofloxacin 750mg orally (60 min prior to procedure)	Gentamicin IV (see dosing table*)	Highly recommended
Endoscopic procedures	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Recommended
Endoscopic ureteric stone fragmentation/ removal	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Recommended. Local recommendation – in high risk patients consider for up to 72 hours post op ¹ .
Percutaneous Nephrolithotomy	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Gentamicin IV (see dosing table*)	Recommended if stone >20mm or pelvicalyceal dilation. Be guided by previous culture results if infected.
Shock wave lithotripsy	Not routine	Not routine	Not routine	Local recommendation: Antibiotics are not given routinely.
Flexible Cystoscopy	If indicated: Gentamicin IV (see dosing table*)	If indicated: Gentamicin IV (see dosing table*)	If indicated: Gentamicin IV (see dosing table*)	Not routinely recommended. Indicated if there is predisposition to infection or foreign body (local recommendation) e.g. catheter insertion or breach of uroepithelium.

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Procedure	1 st Choice	True/ Severe Penicillin allergy	MRSA positive	Comments
Prosthesis insertion	Gentamicin IV (see dosing table*) + Flucloxacillin 2g IV	Gentamicin IV (see dosing table*) + Teicoplanin IV 400mg if <65kg OR 800mg if ≥65kg	Gentamicin IV (see dosing table*) + Teicoplanin IV 400mg if <65kg OR 800mg if ≥65kg	
Radical nephrectomy, Radical prostatectomy	Gentamicin IV (see dosing table*) + Amoxicillin 1g IV +/- Metronidazole 500mg IV	Gentamicin IV (see dosing table*) + Teicoplanin IV 400mg if <65kg OR 800mg if ≥65kg +/- Metronidazole 500mg IV	Gentamicin IV (see dosing table*) + Teicoplanin IV 400mg if <65kg OR 800mg if ≥65kg +/- Metronidazole 500mg IV	Recommended. Consider addition of metronidazole if high risk of infection (e.g. history of diabetes).
Radical cystectomy (including robotic assisted operations)	Amoxicillin 1g IV 8 hourly + Gentamicin IV <i>(dose according to NHSL treatment dose protocol)</i> + Metronidazole 500mg IV 8 hourly	Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg + Gentamicin IV <i>(dose according to NHSL treatment dose protocol)</i> + Metronidazole 500mg IV 8 hourly	Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg + Gentamicin IV <i>(dose according to NHSL treatment dose protocol)</i> + Metronidazole 500mg IV 8 hourly	Recommended. Local recommendation: antibiotics for 3 days' post op. Refer to NHSL's gentamicin treatment dose guidance.

- Dosing specified based on CrCL >60ml/min; if renal impairment consult individual drug product literature.
- 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 1 st 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 <i>Or in penicillin allergy:</i> Ciprofloxacin 400mg IV	Give half original dose of gentamicin, Or consider, Co-amoxiclav 1.2g IV <i>Or if penicillin allergy:</i> 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
Flucloxacillin	2g	IV Re-constitute 2g with 40mL of water for injection and give by slow IV injection over at least 8 minutes.	Repeat 2g	Repeat 2g (again)	Repeat 2g
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	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-99.9	100-109.9	110-119.9	120-129.9	> 130
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	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

¹If 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

- British National Formulary (BNF). Accessed at: <https://bnf.nice.org.uk/drugs/>
- Electronic Medicines Compendium (EMC). Accessed at: <https://www.medicines.org.uk/emc/>
- European Association of Urology (EAU) Guidelines (2024 update). Accessed at: <https://uroweb.org/guidelines/prostate-cancer/chapter/introduction>
- NHS Injectable Medicines Guide (MEDUSA). Accessed at: <https://www.medusaimg.nhs.uk/>
- Scottish Antimicrobial Prescribing Group (SAPG) Good Practice Recommendations for Surgical Prophylaxis (October 2022). Access at: <https://www.sapg.scot/guidance-qi-tools/good-practice-recommendations/surgical-prophylaxis/>