ANTIBIOTIC PROPHYLAXIS IN UROLOGICAL SURGERY

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 and antimicrobial resistance. The Scottish Antimicrobial Prescribing Group (SAPG), along with the Scottish Government, monitors antimicrobial prescribing including surgical prophylaxis in order to reduce the rates of resistance and *C.difficile*. SIGN guideline 104 published in July 2008, and updated in April 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 ≤ 60 minutes prior to skin incision
    - Sub-optimal if >1 hour prior to skin incision or post-skin incision
    - The exception is co-trimoxazole which is a one hour infusion. The window for this is within 2 hours of knife to skin/procedure
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 '4C' antibiotics i.e. cephalosporins, quinolones, clindamycin and co-amoxiclav wherever possible to reduce CDI risk
    - Use narrow spectrum agents when possible to minimise impact on resistance and risk of CDI
    - Take into account local resistance patterns e.g.>95% of MRSA isolated in Tayside are sensitive to gentamicin
    - Provision of alternatives for beta-lactam allergy
    - **Also always consider the most recent urine culture results and sensitivities: ESPECIALLY LOOK FOR ESBLs/other multidrug resistant gram negative bacteria/MRSA**
        - **If gentamicin resistant and trimethoprim sensitive then use co-trimoxazole (dose as per renal function in box below) alternative**
        - **or discuss with Microbiology for suitable alternative**
7. **De-colonisation therapy/MRSA patients**
    - Decolonisation therapy prior to surgery if MRSA positive when recommended in Infection Control Policy
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.

***OPTIONS FOR PATIENTS WITH REDUCED RENAL FUNCTION +/- PENICILLIN ALLERGY:**

For all procedures where gentamicin is indicated alternative options are given below:

- eGFR <30ml/min WITHOUT penicillin allergy – **Aztreonam**
- eGFR <30ml/min and penicillin allergy WITHOUT history of anaphylaxis or angiodema – **Aztreonam**
- eGFR 15-30ml/min and penicillin allergy WITH history of anaphylaxis or angiodema – **Co-trimoxazole**
- eGFR <15ml/min and penicillin allergy WITH history of anaphylaxis or angiodema **– Ciprofloxacin**
- Dialysis patient – **Gentamicin reduced dose 2.5mg/kg (max 180mg)**

For full information on IV Antibiotic Dosing and Administration for Urological Procedures – see last page

Type of Surgery	Procedure	SIGN 104 Recommendation	Tayside Antibiotic Prophylaxis	Comments – ALWAYS CONSIDER MOST RECENT CULTURE RESULTS AND SENSITIVITIES – REFER TO SECTION 6 ABOVE
UROGENITAL	**PROSTATE**			
	Transrectal Prostate Biopsy/ Transperineal Biopsy	'Recommended'	Ciprofloxacin PO 1g 1-2 hours pre biopsy	Gentamicin IV* within 60 minutes prior to procedure if patient unable to take oral ciprofloxacin or it has not been possible to organise.
	Transurethral resection of the prostate (TURP)	'Highly recommended'	*Gentamicin IV	
	Laprascopic Prostatectomy	'Recommended'	*Gentamicin IV	
	Holmium Laser Enucleation of the prostate (HOLEP)	Locally 'recommended'	*Gentamicin IV	
	BLADDER			
	Flexible cystoscopy Stent removal post cystectomy Stent removal post cystectomy for **nephrostomy patients**	Locally 'not recommended' Locally 'not recommended' Locally recommended	Not required	If patient is asymptomatic of UTI **AND** has positive urinalysis **AND** in high risk group as per risk stratification **AND** procedure cannot be delayed then: Gentamicin IV at start of procedure or Oral ciprofloxacin 1g 1-2 hours prior to procedure. Prophylaxis not routinely required Oral ciprofloxacin 1g 1-2 hours prior to procedure for nephrostomy patients only agreed locally. *Local team to review and share audit data with AMG*
	Rigid Cystoscopy (with no procedure)	Locally 'not recommended'	Not required	No antibiotic unless suspicion of infection or planned extra procedure (see below)
	Urethral dilatation Optical urethrotomy Bladder Neck Incision Bladder biopsy Suprapubic catheter insertion	'Recommended'	*Gentamicin IV	
	Transurethral resection of bladder tumours (TURT)	Locally 'recommended'	*Gentamicin IV	SIGN guidance is not to use prophylaxis as there is no specific evidence for this procedure but it is known that there is a high level evidence for TURP and the procedures are not vastly different in their risk of causing infection.

Procedure	SIGN 104 Recommendation	Tayside Antibiotic Prophylaxis	Comments – ALWAYS CONSIDER MOST RECENT CULTURE RESULTS AND SENSITIVITIES – REFER TO SECTION 6 ABOVE
Radical cystectomy (Cystectomy and urinary diversion) Cystoplasty using bowel	'Recommended' Effectiveness is inferred from evidence that SSI is high post-cystectomy	*Gentamicin IV + Metronidazole IV + Amoxicillin IV	Single dose recommended In penicillin allergy replace amoxicillin with vancomycin IV to cover enterococci *Urology team to provide prospective data from local audit and supporting papers to AMG for use of longer prophylaxis.*
KIDNEY			
Laprascopic or open nephrectomy (clean surgery)	Locally 'not recommended'	Not required	
Open partial nephrectomy Open nephroureterectomy	Locally 'recommended'	*Gentamicin IV	
UPPER TRACT AND STONES			
Diagnostic ureteroscopy Endoscopic stone fragmentation/removal	'Recommended'	*Gentamicin IV	
Percutaneous Nephrolithotomy (PCNL)	'Recommended'	*Gentamicin IV	If patient is symptomatic of UTI delay procedure (if clinically appropriate) to complete treatment course of antibiotics, ideally sensitivity guided.
INGUINO-SCROTAL			
Circumcision Dorsal slit Hydrocele repair Epididymal cyst excision Inguinal orchidectomy	Locally 'not recommended'	Not required	
Testicular implants (usually inserted at time of orchidectomy)	No advice given in SIGN	Co-amoxiclav IV	Local practice is to give Co-amoxiclav IV **single dose** Due to anatomical site it is agreed anaerobic cover is required. This patient group tend to be young and lower CDI risk. Also often on chemotherapy and gentamicin would increase nephrotoxicity risk. Penicillin allergy: Co-trimoxazole + Metronidazole

	Procedure	SIGN 104 Recommendation	Tayside Antibiotic Prophylaxis	Comments – ALWAYS CONSIDER MOST RECENT CULTURE RESULTS AND SENSITIVITIES – REFER TO SECTION 6 ABOVE
	RADIOLOGY			
	Insertion of Percutaneous Nephrostomy/Antegrade Ureteric Stent /Nephrostomy change or removal	Not routinely required	Not routinely required If antibiotics are required: Gentamicin* IV	

IV Antibiotic Administration Guidance:

Antibiotic	Dose	Administration	Prolonged surgery (time from administration of initial dose)	>1.5L blood loss redose after fluid replacement
Gentamicin NB: if patient to be **treated for infection** use higher dosing guidance and calculator	4mg/kg (max 400mg) Use Ideal Body Weight (IBW) if >20% overweight IBW = (males 50kg; females 45.5kg) +0.9kg for every cm over 150cm For patients on dialysis gentamicin can be used but give 2.5mg/kg (max 180mg) (as per SAPG gentamicin guidance)	Bolus over at least 5 minutes or infusion Can also be added to metronidazole infusion bag	Redosing only required if surgery longer than 8 hours and eGFR>60ml/min	Give half original dose
Metronidazole	500mg	Infusion over 20 minutes	Only required if surgery >8 hours	500mg
Amoxicillin	1g	IV bolus over 3-5 minutes	1g to be repeated every 4 hours or redose when bowel opened during procedure	1g
Aztreonam	2g	IV bolus over 3-5 minutes (incompatible with metronidazole)	eGFR >30ml/min 2g after 4 hours eGFR <30ml/min 1g after 4 hours eGFR <10ml/min 500mg after 4 hours	as for prolonged surgery
Co-trimoxazole	960mg if eGFR>30ml/min 480mg if eGFR 15-30ml/min	Infusion over 60 minutes	Only required if surgery > 8 hours	Half dose of initial administration
Co-amoxiclav	1.2g	IV bolus over 3-5 minutes	1.2g to be repeated every 4 hours	1.2g
Ciprofloxacin	200mg if eGFR <15ml/min	Infusion over 30 minutes	Only required if surgery > 8 hours	200mg
Vancomycin	1g	Infusion over 100-120 minutes in 250ml 0.9% sodium chloride	Redose 1g after 12 hours	500mg

Developed by: Urology/Microbiology/ID/Pharmacy
Agreed by: AMG June 2014
Updated: June 2022
Review: June 2025