Adult Antibiotic Prophylaxis in Orthopaedic Surgery

NHS Lanarkshire

General Principles of Prescribing for Surgical Prophylaxis

1. **Indication for prophylaxis** should comply with SIGN 104 guideline i.e when 'highly recommended', 'recommended' or 'considered' within guideline.
2. **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
3. **Recording of antibiotic** on ''once only'' section of drug cardex and on Anaesthetic Record Sheet.
4. **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
5. **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.
6. **Arrangements for MRSA and MSSA positive patients**
   - MRSA positive: Decolonisation therapy should be used prior to elective surgery and antimicrobial prophylaxis should include cover for MRSA See NHSL Policy for management of patients colonised or infected with MRSA
   - MSSA positive: Decolonisation therapy should be used prior to certain elective orthopaedic procedures where MSSA screening is in operation

Recommended Agents in Orthopaedic Surgery

- Use antibiotic impregnated cement
- All dosing frequencies specified are based on eGFR>59ml/min/1.73^2; if renal impairment present consult individual drug product literature

Procedure	1st Choice	If MRSA Positive or Penicillin Allergy	SIGN 104 recommendations/other comments
Elective			
Arthroscopy	Not routine	Not routine	
Primary arthroplasty, revision arthroplasty for mechanical reasons, any surgery involving implant	Cefuroxime 1.5g IV OR Flucloxacillin 1g IV +/- [2]Gentamicin 80mg IV (if AKI risk 40mg IV)	[1]Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg +/- [2]Gentamicin 80mg IV (if AKI risk 40mg IV)	Highly recommended. Up to 24 hours of antibiotic prophylaxis should be considered. Additional optional flucloxacillin 1g 6 hourly IV for 24 hours post surgery (to start 6 hours after last prophylactic dose) at discretion of surgeon
Revision surgery with suspected infection	Vancomycin (dose according to NHSL treatment protocol) after all samples have been taken for microbiology. Discuss culture results with Infection Specialist.		
Surgery without implant	Not routine	Not routine	Not recommended
Hand Surgery	Consider Flucloxacillin 1g IV	Consider [1]Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	Should be considered
Trauma –Prophylaxis and Treatment			
Open fracture	Flucloxacillin 1g IV + [2]Gentamicin IV (dose according to NHSL treatment protocol)	[1]Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg + [2]Gentamicin IV (dose according to NHSL treatment protocol)	Highly recommended. Continue antibiotics until closure or review at 1 week. Add Metronidazole 500mg 8 hourly IV if significant contamination.
Open surgery for closed fracture	Cefuroxime 1.5g IV OR Flucloxacillin 1g IV +/- [2]Gentamicin 80mg IV (if AKI risk 40mg IV)	[1]Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg +/- [2]Gentamicin 80mg IV (if AKI risk 40mg IV)	Highly recommended.
Hand trauma (contaminated/open/no bite)	Flucloxacillin 1g 6 hrly IV	[1]Teicoplanin IV 400mg if <65kg or 800mg if ≥65kg	
Human bite	Co-amoxiclav 1.2g 8 hrly IV	Clarithromycin 500mg 12 hrly IV + Metronidazole 500mg 8 hrly IV	Give 7 day treatment course. Switch to oral antibiotics when oral route available. If MRSA positive add [1]Teicoplanin IV (400mg if patient weight <65kg or 800mg if ≥65kg) to prophylaxis. Consult Infection Specialist Regarding 7 day oral treatment course.
Animal bite	Co-amoxiclav 1.2g 8 hrly IV	Ciprofloxacin 400mg 12 hrly IV + Metronidazole 500mg 8 hrly IV	

[1]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 for allergic reactions to teicoplanin [2]Patients considered to be at risk of AKI would have any one of the following factors: Age > 75 years, CKD (eGFR ≤59ml/min), Cardiac Failure, PVD, Diabetes mellitus, Liver Disease or the concurrent administration of other nephrotoxic drugs.

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 eGFR>59ml/min/1.73^2; if renal impairment present consult individual drug product literature

Antibiotic	Dose	Administration	Prolonged Surgery	>1.5L blood loss - Re-dose after fluid replacement
Cefuroxime 1.5g vial	1.5g	Re-constitute 1.5g vial with 15ml of water for injection and give by slow IV injection over 3-5 minutes	Re-dose 1.5g after 4 hours	1.5g
Ciprofloxacin 400mg/200ml solution for infusion	400mg	No dilution required. Give by slow IV infusion into a large vein over 60 minutes.	Not applicable	Not applicable
Clarithromycin 500mg vial	500mg	Re-constitute 500mg vial with 10ml of water for injection then give by IV infusion in 250ml glucose 5% or sodium chloride 0.9% over 60 minutes into a large proximal vein.	Re-dose 500mg after 8 hours	500mg
Co-amoxiclav 1.2g vial	1.2g	Re-constitute 1.2g vial with 20ml of water for injection and give by slow IV injection over 3-5 minutes.	Re-dose 1.2g after 4 hours	1.2g
Flucloxacillin 1g vial	1g	Re-constitute 1g vial with 15-20ml of water for injection and give by slow IV injection over 3-5 minutes	Re-dose 1g after 4 hours	1g
Gentamicin 80mg/2ml vial	80mg (40mg if AKI risk)	No dilution required. Give by slow IV injection over 3-5 minutes.	If pre-op eGFR>59ml/min, re-dose at half prophylaxis dose after 8 hours	If repeat eGFR>59ml/min, re-dose at half prophylaxis dose
Metronidazole 500mg minibag	500mg	Already diluted. Give by IV infusion over 20 minutes.	Re-dose 500mg after 8 hours	500mg
Teicoplanin 400mg vial	400mg if patient weight <65kg or 800mg if ≥65kg	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	200mg if patient weight <65kg or 400mg if ≥65kg

Approved by AMC: June 2019 Approved by ADTC: July 2019 Review date: July 2022 MPR.APORSU.19_13239.L