ANTIBIOTIC PROPHYLAXIS IN IMPLANTABLE CARDIAC ELECTRONIC DEVICE (ICED) INSERTION

NHS Tayside

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 *C.difficile*. Clinical specialties should aim to achieve the target prescribing indicator of a policy compliant antibiotic given to elective patients requiring surgical prophylaxis in ≥95% of sampled cases. Specific clinical areas may be targeted to submit audit data nationally as part of the national work around CDI. 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 as per BSAC ICED Guidance 2014 .

Principles of Antibiotic Prophylaxis Policy

1. **Indication for prophylaxis** should comply with SIGN 104 guideline and BSAC ICED guidance 2014 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
3. **Recording of antibiotic** prescription in 'once only' section of medicine chart to avoid multiple dosing
4. **Documentation in medical notes** of reason for antibiotic administration beyond single dose or state intention for antibiotic treatment course
5. **Choice of agent** should:
    - Avoid cephalosporins and quinolones 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
6. **De-colonisation therapy/MRSA patients**
   Routine screening for MRSA is required as per National Policy for patients undergoing cardiac device insertion if the patient is expected to be admitted for an overnight stay in an acute hospital (acute or emergency admission) **AND**
   - has a previous history of colonisation or infection with MRSA (check on ICE),
   - is admitted from a care home, sheltered housing, prison, homeless hospital or another hospital,
   - has an open wound or ulcer or an invasive device which was present before admission,
   - is admitted to HDU, ICU, renal, vascular or orthopaedic ward
   - **OR** out with these groups on advice of Infection Control and Prevention team
7. **Complex individual prophylaxis** issues should be discussed with Microbiology or Infectious Diseases pre-operatively and recorded in medical notes.
8. **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 AND/OR PENICILLIN ALLERGY:**
For all procedures where gentamicin is indicated alternative options are given below:

- eGFR <30ml/min and no 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)**

IV Antibiotic Administration Guidance:

Antibiotic	Dose	Administration	Prolonged surgery (time from administration of initial dose)	>1.5L blood loss redose after fluid replacement
Teicoplanin	<40kg 400mg >40kg 800mg	Bolus over 3-5 minutes	No repeat dosing required	Give half of original dose if blood loss of >1.5L within first hour of operation
Gentamicin	4mg/kg Use ideal body weight (IBW) if >20% overweight IBW = (males: 50kg, females: 45.5kg) +0.9kg for every cm >150cm	Bolus over 5 minutes or infusion	Redosing only required if surgery > 8 hours and eGFR >60ml/min	Give half of 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

Procedure	SIGN 104 Recommendation	Antibiotic(s)	Comments (if patient is MRSA positive refer to guidance in section 6 above)
Insertion of permanent pacemaker/implantable cardiac device	'Recommended'	Teicoplanin IV *(give <60 mins, > 5 mins pre procedure)* If patient at 'high risk' of gram negative infection add Gentamicin IV Tyrx* envelope used in all high risk patients if consultant deems necessary	If patient cannot tolerate Teicoplanin then Flucloxacillin IV If patient cannot tolerate Teicoplanin **and** has penicillin allergy use Clindamycin IV

*not sourced through pharmacy department

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References:

- SAPG Good Practice Recommendations for Surgical and Procedural Antibiotic Prophylaxis in Adults in NHS Scotland. https://www.sapg.scot/media/4109/gprs-for-surgical-and-procedural-antibiotic-prophylaxis-in-adults-in-nhs-scotland.pdf
- SAPG Recommendations for Re-dosing Antibiotics for Surgical Prophylaxis (currently under review)