ANTIBIOTIC PROPHYLAXIS IN OPHTHALMIC SURGERY PROCEDURES IN ADULT PATIENTS

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 *C.difficile* and resistance. SIGN guideline 104 (published in 2008, updated 2014 and currently under review) 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 Ophthalmology specialty 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 *(under review)* 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
3. **Recording of antibiotic** prescription in 'once only' section of medicine chart or stat dose on HEPMA 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 cephalosporins, clindamycin, quinolones, co-amoxiclav wherever possible
    - Use narrow spectrum agents when possible e.g. avoid carbapenems, piperacillin/tazobactam
    - 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
7. **De-colonisation therapy** prior to surgery when MRSA positive when recommended in Infection Control Policies
8. **Complex individual prophylaxis** issues should be discussed with Microbiology or Infectious Diseases pre-operatively and recorded in medical records
9. **Compliance with local policy** is required and monitored by NHS Tayside. Any deviation from policy must be recorded in the appropriate medical records

IV Antibiotic Administration Guidance:

Antibiotic	Dose	Administration	Prolonged Surgery (measure interval time from the time of the first preoperative dose rather than the surgical incision time)	>1.5L blood loss redose after fluid replacement
Co-amoxiclav	1.2g	IV bolus over 3-5 minutes	1.2g to be repeated every 4 hours	1.2g
Clindamycin	600mg	IV infusion over 20 minutes	600mg to be repeated every 4 hours	600mg
Gentamicin	4mg/kg Use actual body weight (ABW) or ideal body weight (IBW) if ABW>20% over IBW IBW= (males: 50kg, females 45.5kg) + 0.9kg for every cm >150cm	IV bolus over at least 5 minutes or infusion	Repeat original dose ONLY if surgery longer than 8 hours and eGFR >60mL/min	Give half original dose

OPHTHALMIC SURGERY PROCEDURE	SIGN 104 or other guidance recommendation	Antibiotic(s) 1st line	Antibiotic(s) 2nd line (e.g. alternative if anaphylaxis to penicillin or true allergy to cephalosporin)	Timing of administration	Comments
CATARACT SURGERY (routine)	Highly Recommended	Cefuroxime 1mg /0.1mL intracameral or 125mg/mL subconjunctival	Gentamicin 20mg/0.5mL subconjunctival	At end of surgery	**Post- operative:** chloramphenicol 0.5% eye drops 1 drop four times daily for 5 days starting 4 hours post op or following removal of dressing, whichever is later. **Alternative if allergy to chloramphenicol:** ofloxacin 0.3% eye drops 1 drop four times daily for 5 days as above
CATARACT SURGERY (corneal collagen cross-linking – involves removal of the corneal epithelium)					**Post- operative:** moxifloxacin 0.5% (self-preserved) 1 drop four times daily for up to 2 weeks
GLAUCOMA/CORNEAL GRAFTS	Recommended	Cefuroxime 1mg /0.1mL intracameral	Gentamicin 20mg/0.5mL subconjunctival		**Post- operative:** chloramphenicol 0.5% eye drops 1 drop four times daily for 7 days
LACRIMAL SURGERY/ OCULOPLASTICS	Recommended	Local policy is NOT to give antibiotic prophylaxis			
PENETRATING EYE INJURY	Recommended	Refer to NHST Trauma injury guidance Cefuroxime 1mg /0.1mL intracameral	Gentamicin 20mg/0.5mL subconjunctival		See guidance for duration of oral antibiotics after removal of foreign body. Dual intracameral antibiotics may be used depending on site/extent of injury.
VITREORETINAL SURGERIES	Local policy is to give antibiotic prophylaxis	Cefuroxime 125mg/mL subconjunctival	Gentamicin 20mg/0.5mL subconjunctival		**Post- operative:** chloramphenicol
SQUINT SURGERY/STRABISMUS	No prophylaxis required				**Post- operative:** chloramphenicol 0.5% eye drops 1 drop four times daily for 14 days

INTRAVITREAL THERAPY (IVT)/ INTRAVITREAL SAMPLING	No antimicrobial prophylaxis required, pre-procedure topical povidone iodine only				
EVISCERATION/ ENUCLEATION		Co-amoxiclav 1.2 g IV one off dose	Clindamycin 600mg IV + Gentamicin IV single dose	IV antimicrobials administered no more than 60 minutes prior to skin incision	**Post- operative:** chloramphenicol or maxitrol (dexamethasone/ neomycin/polymixin b) for minimum 2 weeks If pre-existing infection prior to surgery for 5 days oral antimicrobials post op: co-amoxiclav 625mg 8 hourly or doxycycline 100mg 12 hourly
SCLERAL BUCKLE/ CRYOTHERAPY AND DRAINAGE		Cefuroxime 125mg/mL subconjunctival	Gentamicin 20mg/0.5mL subconjunctival	At end of surgery	**Post- operative:** chloramphenicol or maxitrol (dexamethasone/ neomycin/polymixin b) for 3days
IMPLANT INSERTION		Chloramphenicol 0.5% eye drops (preservative free) 1 drop pre op and post op			**Post-operative:** chloramphenicol 0.5% eye drops (pres free) 1 drop four times a day for 1 week plus carmellose 0.5% (pres free) four times daily for up to one month
SUTURE REMOVAL	Recommended if broken / loose sutures or wound leak / rupture	Povidone iodine 5% (pres free) given 5 minutes prior to suture removal			**Post-operative:** chloramphenicol 0.5% eye drops (must be pres free if a graft) 1 drop four times a day for 1 week maximum

Notes:

- Active blepharitis, conjunctivitis and nasolacrimal infections should be treated and resolved prior to surgery when possible
- Povidone iodine solution 5% instilled into the conjunctival sac prior to surgery for at least 3 minutes
- All ophthalmic surgeries are given topical antibiotics postoperatively for a variable period of time
- Gentamicin may be painful or toxic to endothelium and retina if inadvertently injected into eye
- For penicillin allergic patients the risk of an allergic reaction to cefuroxime in patients with a known allergy to penicillin is present but small and must be weighed up against the increased risk of endophthalmitis if the injection is withheld in these patients. The Royal College of Ophthalmologist has produced a Clinical Practice Point document for penicillin allergy in elective cataract surgery patients.
- Review antimicrobial choice in light of any positive microbiology and discuss with and infection specialist if required

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References:

1. SIGN 104 Antibiotic Prophylaxis in Surgery. 2014 *(under review)*
2. SAPG Good practice recommendations for redosing antibiotics for surgical prophylaxis in adults
3. Moorfields Eye Hospital Surgical Prophylaxis guidelines