Surgical Antimicrobial Prophylaxis Guidelines (adult)

Appendix 9: Ophthalmic Surgery

Preoperative Considerations

Consider individual risk factors for every patient including the need for prophylaxis. Antibiotic choice/dose may need to be modified according to patient factors (e.g. immune suppression, presence of prostheses, allergies, renal function, obesity, malnutrition, diabetes, malignancy, infection at another site, colonisation with multi-drug resistant bacteria and available pathology).

Consider surgical wound classification (**clean, clean-contaminated, contaminated, dirty-infected)** when determining the need for, or choice of, antibiotic prophylaxis. Refer to Surgical Antimicrobial Prophylaxis Prescribing Guideline for further information.

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure but ensure the treatment regimen has activity against the organism(s) most likely to cause postoperative infection. Adjust the timing of the treatment dose to achieve adequate plasma and tissue concentrations at the time of surgical incision and for the duration of the procedure - seek advice from ID or the AMS team if unsure.

Active conjunctivitis, dacryocystitis or blepharitis should be treated and resolved prior to surgery when possible.

Practice Points

Timing and administration of antibiotics

Surgical antibiotic prophylaxis must be administered before surgical incision to achieve effective plasma and tissue concentrations at the time of incision. Administration of any antibiotic after skin incision reduces effectiveness.

- IV **cefazolin** can be given over 5 minutes and should be administered no more than 60 minutes before skin incision.
- IV **clindamycin** infusion can be given over 20 minutes. It should be fully administered within 120 minutes of surgical incision. Maximum plasma and tissue concentrations occur at the conclusion of the infusion.

Dosing in patients with obesity

- **Cefazolin**: Consider increased dose of cefazolin (3g) for adult patients weighing more than 120kg.

High MRSA risk (defined as history of MRSA colonisation or infection OR frequent stays or a current prolonged stay in hospital with a high prevalence of MRSA OR residence in an area or aged care facility with high prevalence of MRSA OR current residence, or residence in the past 12 months, in a correctional facility):

- Replace IV cefazolin with IV clindamycin

Repeat dosing

A single preoperative dose is sufficient for most procedures; however repeat intraoperative doses are advisable:

- for prolonged surgery (more than 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin dose should be repeated after 4 hours and clindamycin after 6 hours), OR
- if major blood loss occurs (e.g. more than 1500 mL in adults), following fluid resuscitation.

When measuring the time to a second intraoperative dose, measure the interval from the time of the first preoperative dose rather than the surgical incision time.

Recommended Prophylaxis

	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
All procedures	Preoperatively: Immediately prior to surgical incision, apply sterile povidone-iodine 5% swab to conjunctival cul de sac, lid margins and periorbital skin and dry at 2 minutes. In patients with a povidone iodine (Betadine®) allergy, use a sterile product containing chlorhexidine acetate 0.05% for 5 minutes [1].	
Extra-ocular procedures		
Clean procedures > conjunctival procedures > rectus / oblique muscle procedures > entropion / ectropion repair	There is no strong evidence that IV prophylactic antibiotics improve outcomes for clean extra-ocular procedures in otherwise healthy individuals [2, 3]. If required, use:	
	cefazolin 2g IV High risk of MRSA infection: **REPLACE** cefazolin with **clindamycin 600mg** IV infusion	**clindamycin 600mg** IV infusion
Procedures where infection may be present (e.g. Dacryocystorhinostomy)	No strong evidence for IV prophylaxis (as above). Any infection should be treated appropriately following the surgery.	

Recommended Prophylaxis

	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Intra-ocular procedures		
Anterior procedures > phacoemulsification / lens implant > keratoplasty > trabeculectomy / tube implant > corneal graft	**cefazolin 1mg/0.1mL** intracameral injection as a single dose at the end of the procedure [see NOTE 1]	**# Moderate risk penicillin/cephalosporin allergy:** cefazolin intracameral injection may be considered following thorough allergy history and assessment [2, 4] [Cefazolin has no common side chains with other beta-lactam antibiotics, so can often be tolerated in patients with a moderate risk penicillin or cephalosporin allergy. Ensure a complete and thorough history is obtained; if the history is suggestive of a high risk allergy or there is uncertainty, use moxifloxacin (or contact ID)] *** High risk penicillin/cephalosporin allergy:** moxifloxacin 0.15% intracameral injection at the end of the procedure [see NOTE 3]
Vitreous procedures		
Internal vitreous procedures > e.g. retinal detachment repair	Subconjunctival antibiotics not required	
External vitreous procedures > e.g. scleral buckle	**cefazolin 1mg/0.1mL, give 1-2mL** subconjunctival injection as a single dose at the end of the procedure [see NOTE 1]	**# Moderate risk penicillin/cephalosporin allergy:** cefazolin subconjunctival injection may be considered following thorough allergy history and assessment [2, 4] [Cefazolin has no common side chains with other beta-lactam antibiotics, so can often be tolerated in patients with a moderate risk penicillin or cephalosporin allergy. Ensure a complete and thorough history is obtained; if the history is suggestive of a high risk allergy or there is uncertainty, use moxifloxacin (or contact ID)] *** High risk penicillin/cephalosporin allergy:** moxifloxacin 0.15% intracameral injection at the end of the procedure [see NOTE 3]

#Moderate risk penicillin/cephalosporin allergy: History suggestive of moderate risk (e.g. delayed rash which is NOT urticarial or DRESS/SJS/TEN)

*High risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

NOTE 1: OPHTHALMIC INJECTION AVAILABILITY

Cefazolin 5mg/0.5mL pre-loaded syringes are available from an SA Health approved contractor. Alternatively, the cefazolin injection can be reconstituted in the eye clinic/theatre. See below under *Preparation of ophthalmic syringes in eye clinics / theatre.*

NOTE 2: Moxifloxacin for intracameral injection is prepared aseptically using 0.5% eye drops (5mL) (Vigamox®), which are available via the Special Access Scheme and is an alternative ocular antimicrobial for patients with *severe* penicillin/cephalosporin allergy. However due to increasing fluoroquinolone resistance, to avoid overuse of moxifloxacin, a thorough allergy history should be taken. Cefazolin has no common side chains with other beta-lactam antibiotics, so can often be tolerated in patients with a moderate risk penicillin or cephalosporin allergy. Intracameral vancomycin is not recommended due to the risk of haemorrhagic occlusive retinal vasculitis [8]. See below under *Preparation of ophthalmic syringes in eye clinics / theatre* for dilution and administration instructions.

Postoperative Care

There is a lack of strong evidence to support the use of postoperative topical antibiotics in ophthalmic surgical procedures [2]. Prolonged treatment with antibiotic ointment or drops is not indicated unless there is confirmed or suspected infection. For patients who are treated with extended periods of topical steroids or who have been treated with systemic steroids preoperatively, immunological defenses may be reduced and the risk of infection may be increased [9]. If postoperative topical antibiotics are considered necessary due to higher risk of infection, chloramphenicol 0.5% eye drops can be used four times daily for 7 days [2]. Tobramycin eye drops do not have activity against Gram-positive organisms [2].

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

Definitions / Acronyms

AMS	Antimicrobial Stewardship	**DRESS**	Drug rash with eosinophilia and systemic symptoms
ID	Infectious Diseases	**IV**	Intravenous
MRSA	Methicillin-resistant *Staphylococcus aureus*	**SJS / TEN**	Stevens-Johnson syndrome / Toxic epidermal necrolysis

References

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Preparation of ophthalmic syringes in eye clinics / theatre

All preparation of intravitreal and intracameral antibiotics in the eye clinic/theatre must be performed using strict aseptic technique.

Each step of the preparation should be checked by two staff members, one of whom must be a consultant ophthalmologist.

Cefazolin 2mg/0.2mL

1. Reconstitute 1g vial of cefazolin with 3.5mL of Water for Injection and shake to dissolve. This produces a concentration of cefazolin 1000mg/4mL.
2. Draw up 9.6mL of Sodium Chloride 0.9% injection in a 10mL syringe and to this, add0.4mL of cefazolin 1000mg/4mL solution and thoroughly mix (=10mg/mL).
3. Draw up 0.2mL of this solution into a 1mL syringe to produce 2mg/0.2mL. Inject 0.1mLof this solution to give 1mg dose.

Moxifloxacin 1.5mg/1.0mL (0.15%)

Dilution and administration is to be undertaken by an ophthalmologist

1. Attach a 21G needle to a 5mL syringe, insert into opening of moxifloxacin 0.5% (Vigamox®) eye drops and draw up 3mL.
2. Draw up 7mL of Balanced Salt Solution (BSS®) into a 20mL syringe and to this, add the 3mL of moxifloxacin 0.5% (Vigamox®). Mix thoroughly. This produces a moxifloxacin concentration of 15mg in 10mL (0.15%).
3. Draw up 1mL of this moxifloxacin 0.15% solution into a 1mL syringe (1.5mg/1.0mL)
4. Expel 0.6mL of this diluted moxifloxacin 0.15% solution. For intracameral injection, the surgeon injects 0.3mL (450 microgram) to 0.4mL (600 microgram) into the surgical side port, under the distal capsulorhexis edge and then when the eye is exited, administer the remaining dose at the incision to hydrate the incision and make sure the anterior chamber is left pressurised.

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