SECTION 2 INFECTION CONTROL

POLICY SP 2.9	ANTI-MICROBIAL STEWARDSHIP

AIM/OUTCOME: To ensure safe and appropriate antimicrobial prescribing and utilisation is undertaken at all PMA Facilities

REFERS TO: All Clinical Staff
Accredited Medical Practioners (AMPs)

POLICY:

Adherence to the principles of prudent antibiotic use is essential to avoid the danger of emerging drug resistance and provide best practice and quality care for the facility's patients.

The acquisition and spread of resistance to antimicrobial agents is more common in hospitals than in the community. This is due to:

- **The selective pressure exerted by high levels of drug use, which allows the amplification of resistant infectious agents; and**
- **Increased opportunities for transfer of infectious agents between health care workers and patients.**

However the same principles apply for both hospital and community or office practice settings. In all settings, antibiotics should be used according to the principles outlined in the Australian *Therapeutic Guidelines: Antibiotic (*Therapeutic Guidelines Ltd 2019). In addition all prescribers of antibiotics should adopt the 'prudent use principles'.

The Facility recommends that antibiotics used should be appropriate for Ophthalmology, ENT and Dental and the surgical prophylaxis intended to achieve. The Medical Advisory & Audit Committee has been proactive in the Facilities Antimicrobial Stewardship Policy development as the lead clinical advisory and oversight body. This policy has also been endorsed by the Facility Board. All Accredited Medical Practitioners (AMP's) have been informed of the Facilities routine approach to surgical prophylaxis and antimicrobial usage. Antimicrobial usage is documented on MR9 Surgeons Record (operation report) for all patients. The Facility stocks minimal and limited supplies of alternative antibiotics.

Definition of Anti-Microbial:
Antibmicrobials are substances that are safe for human use and that are used to treat or prevent infections caused by microorganisms. Anti microbials agents include:
Anti bacterials (antibiotics), which kill or inhibit the growth of bacteria such as Esherichia coli, and are used for a range of infections such as urinary tract infections
Anti fungals, which kill or inhibit the growth of fungi and yess such as Candida species, and are used for fungal infections such as thrush
Anti virals, which kill or inhibit viruses such as herpes simplex virus, and are used for viral infections such as cold sores
Antiparasitic agents, which destroy parasites, and are used for parasitic infections such as intestinal worms

Anti septic agents, which are chemical applied to skin or other living tissue to unhibit or kill microrganisms, such as alchohol used to disinfect during

BACKGROUND:
In April 2013 all PMA Facilities undertook an audit of Antimicrobial usage within each centre. The audit found that there was no inappropriate antibiotic or antimicrobial utilization. The Facilities MAAC's reviewed the findings and observed varying degrees of surgical prophylaxis utilization between surgeons and facilities across the PMA group. At that time The Royal Australian and New Zealand College of Ophthalmologists left the utilization of prophylactic antibiotics entirely up to the discretion of the Ophthalmologist (no position paper).

Concurrently management investigated with Australian (Sydney Eye Hospital) and International (Moorfields Eye Hospital, London and Birmingham Eye Hospital) Eye Hospitals Pharmacy Departments and the growing evidence in the literature (European Society of Cataract & Refractive Surgery Guidelines for Prevention & Treatment of Endophalmitis Following Cataract Surgery) on the evidence-based used of intra-cameral Cephalosporins for surgical prophylaxis.
A Compounding Pharmacy, utilizing a purpose-built ISO Class 7 compound facility, was engaged to supply sterile, pre-packaged Cephazolin and Cefuroxime (both Cephalosporins) for the PMA Facilities. The provision of sterile pharmacy supplied syringes was endorsed by the MAAC to alleviate concerns by some Ophthalmologists regarding the titration and dilution within theatre and to encourage their utilization. The Pharmacist and our Consultant Microbiologist endorsed this approach.

In 2016, RANZCO released Preferred Practice Patterns: Cataract and Intraocular Lens Surgery which endorsed the principles of the use of intra- cameral antibiotic at the end of cataract surgery. This information was further endorsed 2021.

ANTIMICROBIAL STEWARDSHIP PROGRAM
Governance & Risk:

- The MAAC provides clinical governance and oversight of this program. The Facility Board provides corporate oversight.
- Supporting Infection Control policies and procedures are contained within the Safe Practice & Environment Function manual including the Infection Control Management Plan 2014 and Infection Control reporting mechanisms, amongst others.
- Management in conjunction with the MAAC and Board review clinical indicators (L & M 3.2.2. Clinical Indicators and Audits) as part of our ongoing surveillance program. Indicators include:
    - ACHS: Re-admission Cataract within 28 days – Endophalmitis
    - ACHS: Re-admission Glaucoma within 28 days – Endophalmitis
    - ACHS: Re-admission Retina within 28 days – Endophalmitis
    - ACHS: Cataract Surgery – toxic anterior segment syndrome (TASS)
    - ACHS: Cataract Surgery – antibiotic prophylaxis
    - QPS: Post-operative infections
        - ACHs User Manual -Ophthalmology Clinical Indicator (Year 2017)

Risk Assessment:

- An audit of Antimicrobial Usage within each PMA Facility is conducted annually. This is due to the low risk identified following the first audit in 2013.
- The results of this audit will be reviewed by Management and the MAAC and Facility Board for review and analysis. An action plan will be developed by Management to address any recommendations and conclusion.
- The Facility Risk Register identifies the prevention and control of infections including post-operative infections as a top fifteen risk. The Antimicrobial Stewardship Program has been developed to minimize and mitigate this risk.

Antimicrobial Usage

- Evidenced-based literature supports the utilization of intra-cameral Cephalosporins injected at the end of cataract surgery cases - (cataract surgery amounts to 80% of the total surgical workload across the PMA Facilities) 0.048% (.48 infections per 1000 cases) with Cephalosporin vs 0.35% (3.5 infections per 1000 cases) without Cephalosporin [ESCRS 2013]
- The MAAC endorsed surgeons having the choice of two Cephalosporins – Cephazolin and Cefuroxime. This is because Sydney Eye Hospital utilises Cephazolin whilst many of the European studies utilize Cefuroxime. Both have the same efficacy for surgical prophylaxis
- The prescribing of Cephazolin and Cefuroxime for cataract surgery prophylaxis is consistent with the Therapeutic Guidelines (Australian): Antibiotic (2020). The guidelines "Note 38: … intracameral cefazolin is recommended for prevention of Endophthalmitis after cataract surgery because a parenteral formulation of cefuroxime (which was used in the key randomised controlled trial) is not readily available in Australia".
- The Royal Australian and New Zealand College of Ophthalmologists (RANZCO), 2021 recommends that intra cameral antibiotics be injected at the end of cataract surgery for Endophthalmitis prophylaxis. In the ESCRS Study (2007) not using intra cameral Cefuroxime was associated with 5 times increase in risk of developing endophthalmitis.
  In Australia and New Zealand Cefuroxime is not readily available. Intra cameral Cefazolin 1mg /01 ml is often used as an alternative. Where subconjunctival and topical routes of prophylactic antibiotic administration at the time of surgery may be considered as alternatives, the evidence base for their use remains weak. It may be prudent to use these when intra cameral antibiotic is not given.
- PresMed facilities procures and supplies compounding pharmacy sterile, pre-packaged Cephazolin and Cefuroxime. The ready to use (pre-filled) syringes of Cefazolin 3mg/0.3 mL and Cefuroxime 3mg/03mL injection is suitable for intra cameral injection. In the event that ready to use Cefazolin intra cameral syringes are not available, clinical staff are authorised to prepare the injection for IMMEDIATE use following steps outlined CM 2.7. 1A 'Instructions for Diluting Intra cameral Medications'. The instructions are readily available in each theatre. A clinical competency is undertaken annually by scrub staff to ensure their compliance.
    - Surgeons may elect to utilize either of these two antibiotics.
- The Guidelines and eMIMS are available in every PMA Facility.
- Alternative pre-packaged antibiotics will not be provided by the Facilities in order to discourage other antibiotic utilization inconsistent with the evidence in the literature.
- The use of intracameral antibiotics continues to be entirely up to the discretion of the treating Surgeon.
- Minimal supplies of alternative antibiotics are available at the Centre for peri-operative utilization. A limited amount of Ceftazidime and Amikacin to use for Intravitreal injection in treating Endophthalmitis in the acute phase is available. These antibiotics must be prepared by the scrub or surgeon at the time of use. A clinical competency is undertaken every year by scrub staff to ensure their compliance.
- The MAAC and Clinical Microbiologist have identified Vancomycin as a restricted antibiotic for ophthalmic perioperative utilization. Vancomycin's use is restricted across the PMA Facilities.
- Ophthalmic Surgeons and peri-operative nursing staff document on MR9 - Surgeons Record the antimicrobial used and administered.
- Povidone- Iodine (5-10%) (PVI) is used for all pre-operative antisepsis, unless allergy/contraindication, then aqueous chlorhexidine 0.05% is utilized.
- PVI is applied for three minutes to the cornea, conjunctival sac and periocular skin.
- Pre and post-operative antibiotic eye drops/Ung are also utilized at the Facilities. The eye drops/Ung utilized is consistent with the Therapeutic Guidelines – Antibiotic.

Risk of intra cameral injection of Cefazolin/Cefuroxime include:

- Intraocular inflammation
- Corneal endothelial injury

Cephalosporin &/or Pencillin Allergy

In May 2022, following a case of endophthalmitis post cataract surgery whereby prophylactic intra-cameral Cephalosporin was withheld due to a penicillin allergy (rash/itch), the MAAC sought advice from The Royal Victorian Eye and Ear Hospital (Sydney Eye Hospital did not respond) regarding Cephalosporin use and Penicillin allergy as follows.

Cephalosporin Allergy	**Severe**: T-cell or IgE mediated rash, severe cutaneous adverse reactions, anaphylaxis, hypotension, collapse, respiratory involvement or widespread rash	**Non-Severe**: immediate localised or mild urticarial rash or delayed rash
	AVOID Cefazolin/Cefuroxime	**SAFE** to use Cefazolin/Cefuroxime

Penicillin Allergy	**Severe**: severe cutaneous adverse reactions e.g. Stevens-Johnson Syndrome - SJS, Toxic epidermal necrolysis - TEN, Acute generalised exanthematous pustulosis - AGEP, drug reaction with eosinophilia and systemic symptoms – DRESS or Anaphylaxis, hypotension, collapse, respiratory involvement or widespread rash or delayed rash)	**Non-Severe**: immediate localised or mild urticarial rash or delayed rash
	AVOID Cefazolin/Cefuroxime	**SAFE** to use Cefazolin/Cefuroxime
	CONSIDER Vancomycin: sub-conjunctival or intra-cameral (consider the risk of potential haemorrhagic occlusive retinal vasculitis (HORV) with intra-cameral)	

In November 2022, the MAAC endorsed the above for the information of Ophthalmologists/Anaesthetists decision-making. The MAAC noted that the choice of alternative prophylactic antibiotics remained an Ophthalmologist's decision.

Education

- All Ophthalmic Surgeons were educated about the availability of intra-cameral Cephalosporins consistent with the Antimicrobial Stewardship Policy via correspondence in December 2013.
- All Ophthalmic surgeon applications for accreditation sign that they have read and understood the antimicrobial policy in the Clinical Education Pack. The Clinical Education Pack is updated annually to ensure currency with this policy.
- In 2021, after a recent outbreak of TASS (Toxic Anterior Segment Syndrome) at one of the facilities, the Board and MACC determined to raise the awareness of Ophthalmologists to RANZCO Guidelines on TASS -2015. The Guidelines provides advice on factors believed to be contributory to TASS which could be relevant for Ophthalmologist's surgical practice, particularly in relation to the post-operative application

of Providine Iodine and ointments (Chloromycetin / Jelonet with Paraffin Ung). The Board and MAAC determined that their post-operative application was a matter of surgeon choice in relation to these.

Guidelines

- The orientation check-list for new surgeons and annual clinical education pack covers Antimicrobial Stewardship.
- Nursing staff education is provided on orientation, annual education pack and at the regular staff meetings. Scrub staff complete a competency on intra-cameral usage every year.
- The Facility is a member of The Australian College for Infection Prevention & Control and receives their regular journal. The Facility also subscribes to the ESCRS Journal of Cataract & Refractive Surgery to ensure that we remain up to date on antimicrobial matters.
- Management attend Australian and International Ophthalmic Conferences yearly.
- A Clinical Microbiologist provides consultancy advice to the group as required.

Reporting Adverse Events:

- All patients are screened for adverse drug allergies prior to administration
- For patients that have a reported or experience an adverse event reaction to medicines, this information is reported in the patients' health care record and is included in the "MY Health Record' discharge summary
- For patients that experience a reaction, the prescribing doctors refers the patient directly to an allergy testing unit or to General Practioner for follow up.
- Adverse reactions to anti-microbial are reported as a clinical indicator, QSIR and Risk Clear and reviewed Quality Review Committee, MACC and Board.

Dispensing Anti-Microbial:

- Presmed facility doctors dispense limited anti-microbial. This is restricted to medicines such as Chloromycetin, Ciloxin eye and ear drops. The dispensed drug is accompanied with a consumer information sheet. Drug Information labels includes date of dispensing, name of drug, frequency and route of administration and dispensing doctors name. This information is documented in the medical record and discharge summary that is uploaded to "My Health Record"
- The MR 6 Medication Chart provides a record to document the clinical reason, active ingredient, dose, frequency, route of administration and intended duration.

PERFORMANCE INDICATORS:

This policy relates to entries on the Risk Register (Policy L&M 3.6) and audited annually:
Clinical Management – Preventing and Controlling Infections including Post Operative Infections – Endophthalmitis and TASS
Safe Practice

1. ACHS Indicators: Readmission within 28 Days for Endophthalmitis – Cataracts, Glaucoma, and Retinal Detachment Updated referenced, Cataract Surgery- Antibiotic prophylaxis
2. QPS Audits and Indicators: Post Operative Infections, Infection Control Assessment, Competency Testing for Infection Control
3. PMA Audits: Hand Hygiene, SSD AS4187 Audit, Medication Chart

ATTACHMENT: SP 2.9.1 Antibiotic Consumer leaflet- for education
SP 2.9.2 NCAS 'Penicillin Allergies - Information for hospital clinicians' 2019

REFERENCES:

1. National Health and Medical Research Council "*Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)"*
2. Antibiotic Expert Group. "Therapeutic Guidelines Antibiotic *(2010)*"

3. The Royal College of Ophthalmologists (UK) *"Managing an Outbreak of Postoperative Endophalmitis (2014)"*
4. American Society of Health-System Pharmacists *"Handbook on Injectable Drugs (16th Edn)"*
5. European Society of Cataract & Refractive Surgery *"ESCRS Guidelines for Prevention and Treatment of Endophalmitis Following Cataract Surgery: Data, Dilemmas and Conclusions (2013)"*
6. Personal email correspondence from Clinical Pharmacists – *Sydney Eye Hospital, Moorfields Eye Hospital (London) & Birmingham Eye Hospital.*
7. European Society of Cataract & Refractive Surgery & American Society of Cataract & Refractive Surgeons *"Journal of Cataract & Refractive Surgery (various articles)"*
8. *Therapeutic Guidelines – Antibiotic Therapeutic Guidelines Limited (2019*)
9. Reference *ACHS Ophthalmology Clinical Indicator User Manual Version 6 (2017)*
10. *ACSQHC "Australian Commission on Safety and Quality in Health Care " 2020*
11. RANZCO *"Guidelines on Toxic Anterior Segment Syndrome" 2015*
12. RANZCO "Guidelines for Performing Intravitreal Therapy: Appendix" C, 2017
13. ACSQHC "Antimicrobial Stewardship Clinical Care Standard November "2020
14. The Royal Victoria Eye and Ear Hospital 'Procedure Intra cameral Cefazolin Procecdure'.V7 2020
15. RANZCO 'Preferred Practice patterns: Cataract and Intraocular Lens Surgery' June 2021

RATIFIED BY:	Quality Review Committee
DATE:	June 2022
REVIEW DATE:	July 2024
PREVIOUS REVIEW:	2009, 2011, 2014, 2017, 2020, 2021

DATE	POLICY CHANGES
June 2022	• Addition reference: The Royal Victoria Eye and Ear Hospital 'Procedure Intra cameral Cefazolin Procecdure'.V7 2020 RANZCO 'Preferred Practice patterns: Cataract and Intraocular Lens Surgery' June 2021 • Addition reference to RANZCO recommendation intra cameral antibiotics • Addition Ophthalmologists sign of Anti-Microbial guidelines • Addition Risk of Intra cameral Injection of Cefazolin • Addition attachment SP 2.9.2 NCAS 'Penicillin Allergies - Information for hospital clinicians' 2019
July 2021	• Addition reference *ACSQHC 'Australian Commission on Safety and Quality in Health Care '2020* • Addition reference RANZCO *'Guidelines on Toxic Anterior Segment Syndrome' 2015* RANZCO 'Guidelines for Performing Intravitreal Therapy: Appendix C', 2017 • Updated reference to Therapeutic Guidelines in body of document • Annual education pack covers antibiotic stewardship • Addition Intra Vitreal antibiotics, • Addition reference to 2021 MACC correspondence- TASS contributing factors • Addition reporting Adverse Events • Addition reporting dispensing Antimicrobials • Addition Attachment: SP 2.9.1 Antibiotic Consumer leaflet- for education
October 2020	• Updated references • Amended CMP to AMP • Updated ACHS Clinical Indicators

May 2014	• Updated terminology in line with current practice and Equip National requirements • Updated references. • Updated terminology