National Antimicrobial Prescribing Survey

Antimicrobial prescribing for perinatal infections

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Introduction

Perinatal infections are transmitted from a mother to the baby during pregnancy, labour, or shortly after birth. These infections can occur when pathogens cross the placenta, ascend from the birth canal, or are transmitted to the newborn through blood, bodily fluids, or breast milk.

These infections are clinically significant as they can lead to serious complications, including preterm birth, congenital abnormalities, neonatal illness, and death. Common examples include toxoplasmosis, cytomegalovirus (CMV), herpes simplex virus (HSV), syphilis, hepatitis B, human immunodeficiency virus (HIV), and group B Streptococcus (GBS).

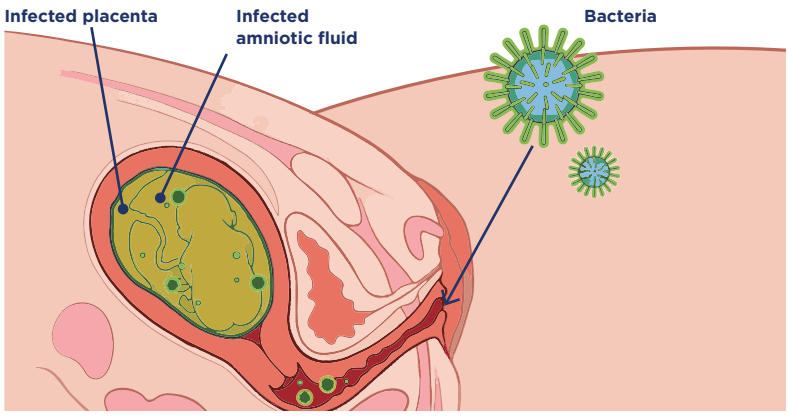
All of these can adversely affect fetal and neonatal outcomes if not identified promptly and managed appropriately.

This circular is limited to clinical indications specific to pregnancy, including **chorioamnionitis, preterm prelabour rupture of membranes,** and **perinatal group B Streptococcal prophylaxis.**

Risks of perinatal infections and inapproprate antimicrobial use

- Neonatal harm including preterm birth, congenital abnormalities, neonatal illness and death
- Maternal harm including maternal sepsis, postpartum endometritis and postpartum haemorrhage
- Prolonged infection and/or treatment failure
- Antimicrobial adverse effects and/or toxicity
- Greater healthcare burden and cost
- Antimicrobial resistance

Chorioamnionitis is an infection involving the amniotic fluid, placenta, fetus, fetal membranes or decidua. Antibiotic treatment helps reduce maternal and fetal complications. However, complete resolution of the infection generally occurs after birth. Therefore, antimicrobials can safely be stopped postpartum in most instances.



Preterm prelabour rupture of membranes (PPROM) refers to rupture of the amniochorionic fetal membranes before 37 weeks gestation and before the onset of uterine contractions. Antibiotic prophylaxis for PPROM aims to delay birth and decrease morbidity and mortality associated with maternal, fetal, and neonatal infections. The prophylaxis regimen targets the same pathogens as in chorioamnionitis.

Common pathogens in chorioamnionitis and PPROM

Most infections are polymicrobial and are caused by organisms from the vagina and cervix that ascend into the uterus.

Genital mycoplasma organisms

- *Ureaplasma urealyticum*
- *Mycoplasma hominis*

Anaerobic organisms

- *Bacteroides* species
- *Prevotella species*
- *Fusobacterium* species
- *Peptostreptococcus* species
- *Gardnerella vaginalis*

Aerobic organisms

- *Escherichia coli*
- Group B Streptococcus *(Streptococcus agalactiae)*

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Guideline recommendations for empiric therapy of chorioamnionitis

Gentamicin OR **Tobramycin** (refer to local or national guidelines for dosing guidance)

+

Amoxicillin 2 g IV, 6-hourly OR
Ampicillin 2 g IV, 6-hourly

+

Metronidazole 500 mg IV, 12-hourly

Duration of therapy: For patients with no complications, postpartum continuation of antimicrobials are likely not required.

Guideline recommendations for empiric therapy of PPROM

Amoxicillin 2 g IV, 6-hourly OR
Ampicillin 2 g IV, 6-hourly for 48 hours followed by **oral amoxicillin** (refer to local or national guidelines for dosing guidance)

+

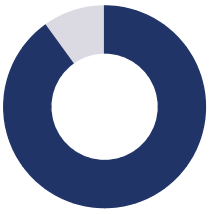
Azithromycin 1 g oral, as a single dose (a 7-day course of erythromycin can be used as an alternative)

Duration of therapy: Total of 7 days (IV + oral) or until birth (whichever is sooner).

Note: refer to local or national guidelines for suitable regimens in women with penicillin allergy and/or renal impairment

Hospital NAPS 2015 – 2024

1,086 prescriptions
(321 prescriptions for chorioamnionitis and 765 prescriptions for PPROM)



91% of prescriptions had an **indication documented**

56% of prescriptions had **a review** or **stop date documented**

Compliance with guidelines*

77% (786 prescriptions) were compliant with national or local guidelines

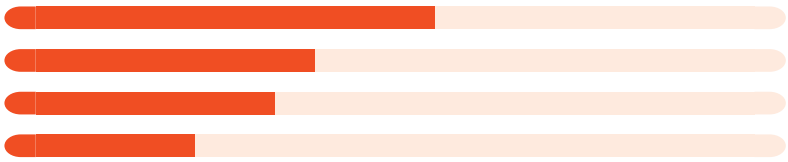
*Excluding 12 prescriptions for directed therapy and 51 prescriptions which were not assessable/had no guidelines available

Appropriateness*

82% (868 prescriptions) were deemed appropriate

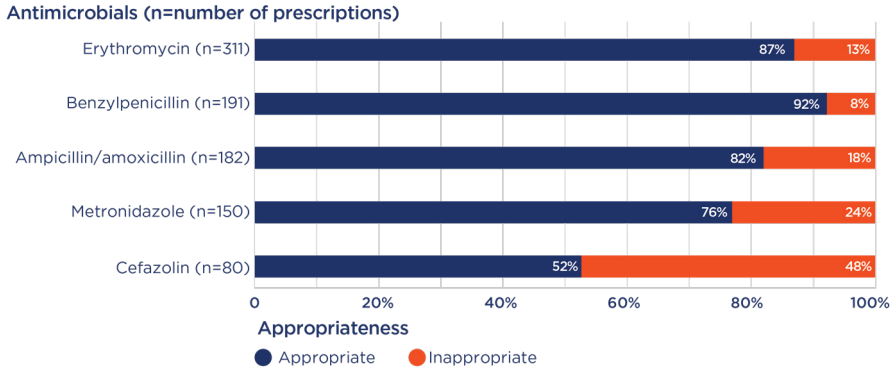
*Excluding 23 prescriptions which were not assessable

Common reasons for inappropriate prescribing



52% Incorrect dose or frequency
38% Spectrum too narrow
32% Incorrect duration
22% Spectrum too broad

Most common antimicrobials and prescribing appropriateness



High prescribing appropriateness was observed for erythromycin and ampicillin/amoxicillin, but not for cefazolin. Interestingly, although benzylpenicillin is not routinely recommended in guidelines, it was the second most commonly used antimicrobial and was predominantly assessed as appropriately prescribed.

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Most common reasons for inappropriate prescribing

Cefazolin

- Spectrum too broad: used as first-line therapy in patients with no history of penicillin hypersensitivity
- Spectrum too narrow: sole antimicrobial used in chorioamnionitis
- Incorrect dose: 1 g IV, 8-hourly prescribed, instead of 2 g IV, 8-hourly in both chorioamnionitis and PPROM

Metronidazole

- Incorrect dose/frequency: three times daily dosing instead of twice daily dosing prescribed
- Incorrect duration

Ampicillin/amoxicillin

- Incorrect dose: 1 g IV, 6-hourly prescribed instead of 2 g IV, 6-hourly in both chorioamnionitis and PPROM

Perinatal group B Streptococcal prophylaxis

Streptococcus agalactiae is an organism often found in the gastrointestinal and genital tracts in up to 30% of healthy females of childbearing age. Intrapartum prophylaxis reduces the risk of perinatal transmission and risk of neonatal infection by up to 80%. Prophylaxis should be administered at the onset of labour, and ideally at least 4 hours before birth.

Screening for GBS carriage

- Collect a urine sample and combined low vaginal and anorectal swab.
- Collect samples between 35 to 37 weeks gestation, or 3 to 5 weeks before the anticipated delivery date.
- If GBS is detected in the urine, prescribe treatment for asymptomatic bacteriuria guided by culture and susceptibility results.
- Isolation of GBS from a combined low vaginal and anorectal swab does not require treatment until labour commences.

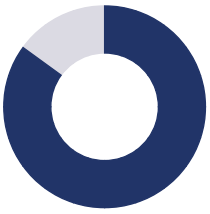
Guideline recommendations for intrapartum prophylaxis

Benzylpenicillin 3 g IV for the first dose, then 1.8 g IV, 4-hourly until birth

Note: refer to local or national guidelines for suitable regimens in women with penicillin allergy and/or renal impairment

Hospital NAPS 2015 – 2024

765
prescriptions were for perinatal GBS prophylaxis



84%
of prescriptions had an **indication documented**

Compliance with guidelines*

87% (641 prescriptions) were compliant with national or local guidelines

*Excluding 20 prescriptions for directed therapy, 11 prescriptions which were not assessable/had no guidelines available

Appropriateness*

88% (670 prescriptions) were deemed appropriate

*Excluding 6 prescriptions which were not assessable

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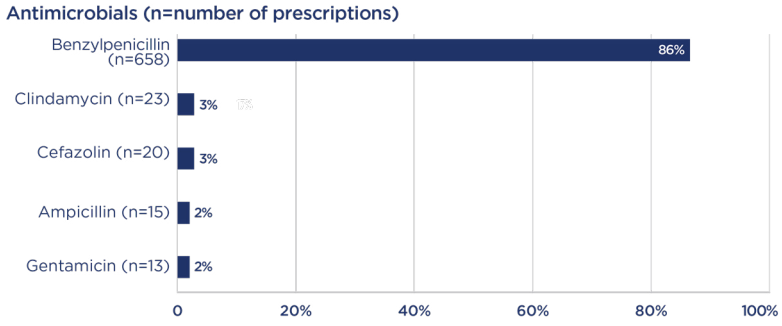
Most commonly used antimicrobials in GBS prophylaxis



Most common reasons for inappropriate prescribing

Benzylpenicillin

Incorrect dose or frequency: 600 mg or 1.2 g IV, 4-hourly prescribed instead of 1.8 g IV, 4-hourly in GBS prophylaxis, and incorrect duration

Clindamycin

Incorrect dose or frequency: 900 mg IV, 8-hourly prescribed, instead of 600 mg IV, 8-hourly in GBS prophylaxis

Implications for clinical practice

If antimicrobials are prescribed, ensure the choice, dose, frequency and duration align with national evidence-based guidelines e.g. *Therapeutic Guidelines,* and adjust for renal function where relevant.

Recommendations for patients with a history of penicillin hypersensitivity have recently changed. Beta-lactams may be used as first-line therapy in patients with either non-severe or severe immediate hypersensitivity to penicillins, depending on the clinical context.

Rates of clindamycin resistance in GBS are increasing globally. In Australia, recent national data suggests up to 35% of isolates are clindamycin resistant. Consider testing for clindamycin resistance. Vancomycin is preferred if clindamycin resistance is not tested.

Ensure antimicrobial prescription includes a clear indication, intended duration, and review or stop date.

About the NAPS

The National Antimicrobial Prescribing Survey (NAPS) program consists of standardised audits that assist hospitals, residential aged care homes, and other health services to assess the quality of their antimicrobial prescribing practices. The program is delivered and coordinated by the Royal Melbourne Hospital Guidance Group and the National Centre for Antimicrobial Stewardship. The NAPS program contributes to the Antimicrobial Use and Resistance in Australia surveillance program, with funding provided by the Australian Centre for Disease Control.

To learn more about the program, visit: www.ncas-australia.org/National_Antimicrobial_Prescribing_Survey.
For support, contact the NAPS support team via email: support@naps.org.au

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