THE UNIVERSITY OF WESTERN AUSTRALIA

DENT 3005:Introduction to Pharmacology

Anti-infectives

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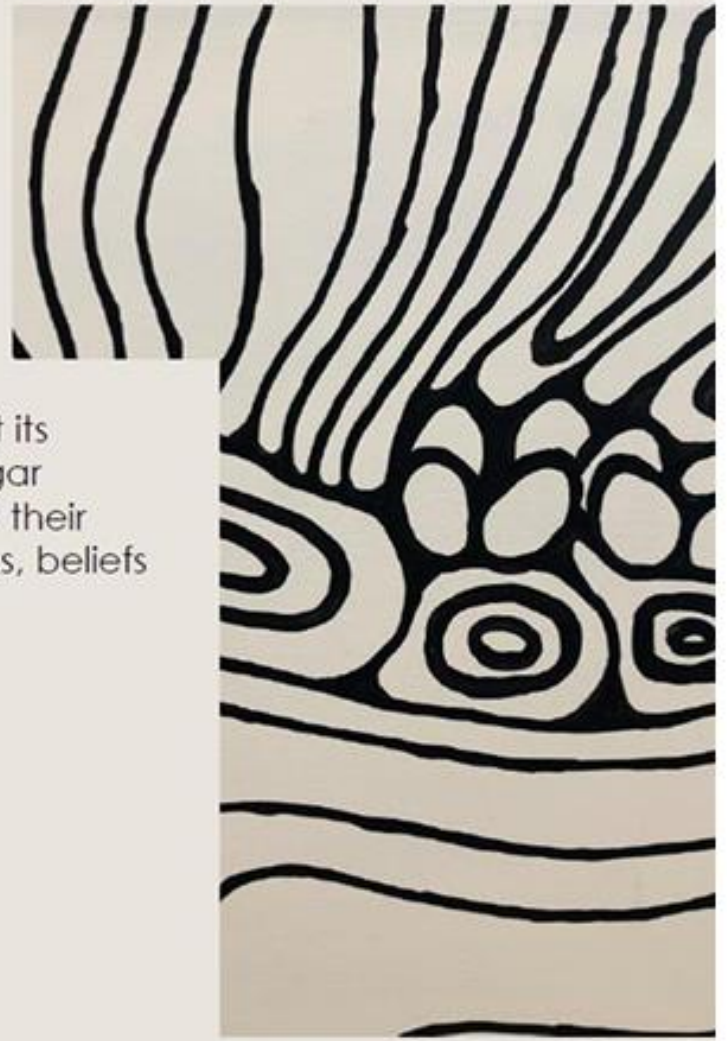
Acknowledgement of country

The University of Western Australia acknowledges that its campus is situated on Noongar land, and that Noongar people remain the spiritual and cultural custodians of their land, and continue to practise their values, languages, beliefs and knowledge.



Artist: Dr Richard Barry Walley OAM

Learning Outcomes

Learning objectives

1) Understand the different types of anti-infective drugs and their mechanism of action
    1) Antibacterials
    2) Antifungals
    3) Antivirals
    4) Antiprotozoals
    5) Anthelminthics
2) Understand antimicrobial resistance and factors influencing antibiotic selection
3) Understand antimicrobial stewardship
4) Understand indication, dosing direction and regimen for antibacterial in the dental setting
5) Recognise oral and dental side effects of these drugs
6) Understand drugs interactions with dental medications
7) Applied knowledge to clinical scenarios

Anti-infectives

- Definitions
  - Anti-infective = antimicrobial → broad term for anything combating infections
  - Anti-bacterial: fight bacteria!
  - Anti-viral: against viruses
  - Anti-fungal: against fungus etc, you get it ☺
- Indications: not comprehensive!
  - Based on clinical practice & evidence, may include non-marketed use
- Drug groups
  - Antibacterials, Antifungals, Antivirals , Antiprotozoals, Anti-helminthics
- Antimicrobial: empirical Vs prophylaxis
  - Non-Surgical Vs Surgical prophylaxis

RESISTANCE!

- **AMR = microbes evolve to resist drugs** → undermines treatment, endangers global health
- It's the microbe, not the drug, that changes
- **Resistance Mechanisms (ABs)**
  - Limited uptake, target modification, drug inactivation, efflux pumps
- **Spread:** Mutations, viral mutation, plasmid transfer
- **Drivers**: Overuse/misuse in healthcare and agriculture, incomplete courses.
- **Solutions**: Prescribe judiciously, follow guidelines, improve diagnostics, raise awareness

Antimicrobial Stewardship (AMS) in Dental Practice

- **AMS**: Optimize antibiotic use to reduce resistance
- **Goal**: Right drug, dose, duration – only when needed
- **Why**: Prevent AMR, toxicity, and high costs.
- **Strategies**
  - Follow guidelines
  - Use narrow-spectrum drugs
  - Consider local resistance
- **Complementary**: Infection control, hygiene, surveillance
- **Tailored approach**: Adjust based on resources
- **Key resource**: AMS in Australian Hospitals guide
- **Your role**: Prescribe responsibly

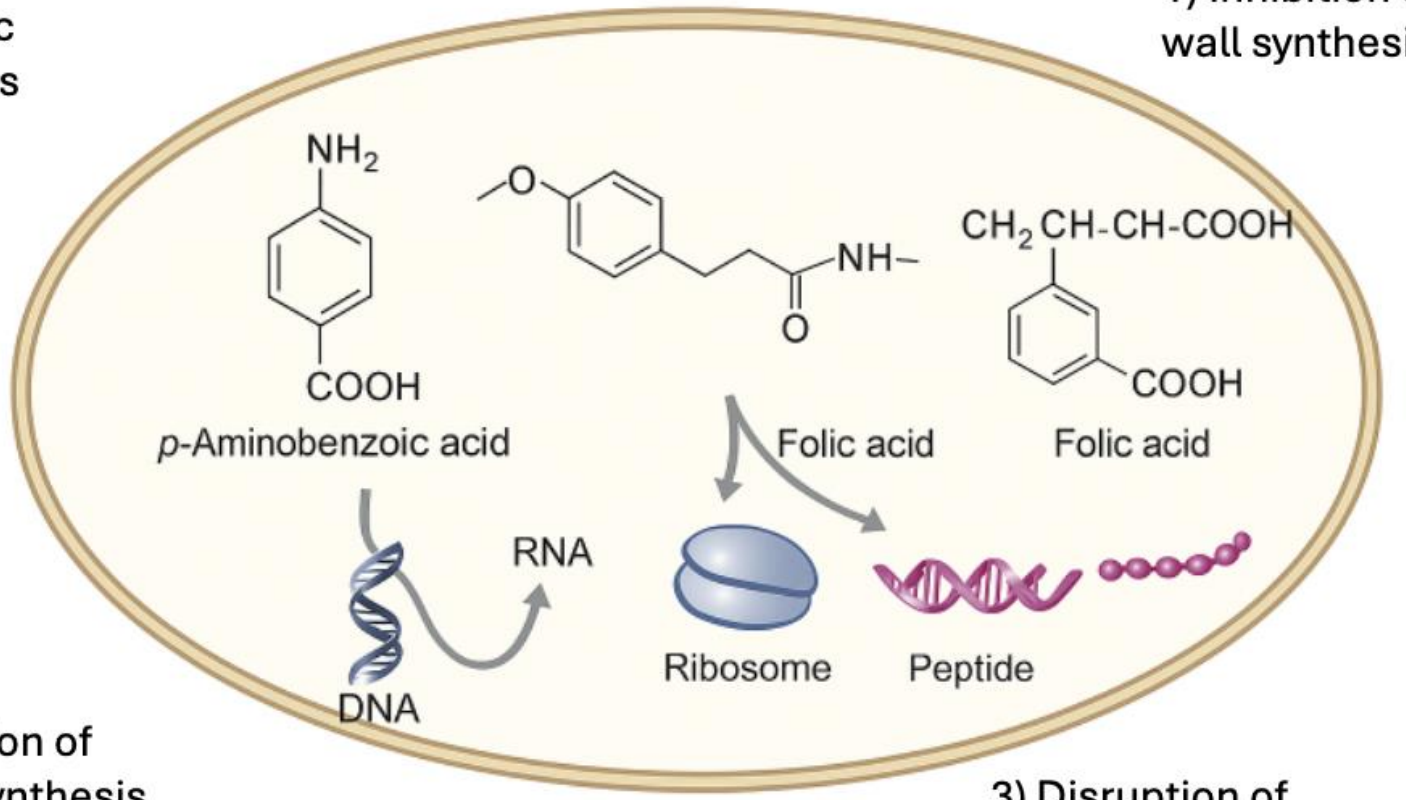
Antibacterials

Bactericidal	Bacteriostatic
Aminoglycosides	Lincosamides
Carbapenems	Macrolides
Cephalosporins	Tetracyclines
Glycopeptides	Antimycobacterials
Penicillins	Linezolid
Quinolones	Nitrofurantoin
Rifamycins	Sodium fusidate
Antimycobacterials	Tigecycline
Monbactams	Trimethroprim
Colistin	Trimethoprim + sulfamethoxazole
Macrocyclic antibacterial	
Fosfomycin	
Methenamine Hippurate	
Metronidazole	

Antibacterials: main class and MOA

4) Interference w/ metabolic processes

1) Inhibition of cell wall synthesis



2) Inhibition of protein synthesis

3) Disruption of microbial cell membrane

Class	Mechanism of Action	Examples
Beta-lactams	Inhibit cell wall synthesis (bind PBPs) → cell lysis	*Penicillins, Cephalosporins, Carbapenems*
Aminoglycosides	Bind 30S ribosome → misread mRNA → faulty proteins → cell death	*Gentamicin, Amikacin*
Macrolides	Bind 50S ribosome → block peptide elongation (bacteriostatic)	*Erythromycin, Azithromycin*
Fluoroquinolones	Inhibit DNA gyrase/topoisomerase IV → block DNA replication	*Ciprofloxacin, Levofloxacin*
Tetracyclines	Bind 30S ribosome → block tRNA binding → inhibit protein synthesis	*Doxycycline, Minocycline*
Sulfonamides	Inhibit folic acid synthesis (dihydropteroate synthase) → bacteriostatic	*Sulfamethoxazole (+ trimethoprim)*
Glycopeptides	Bind D-Ala-D-Ala → block cell wall synthesis → lysis	*Vancomycin*
Polypeptides	Disrupt cell membrane → leakage of contents → cell death	*Bacitracin, Polymyxin B*
Oxazolidinones	Bind 23S RNA of 50S ribosome → inhibit initiation complex	*Linezolid*
Rifamycins	Inhibit RNA polymerase → block transcription → cell death	*Rifampin, Rifabutin*
Nitrofurans	Damage DNA, RNA, and proteins → broad metabolic inhibition → cell death	*Nitrofurantoin*

Penicillins

- **MOA:** Bactericidal; interfere with bacterial cell wall peptidoglycan synthesis
- **Drug interactions**
  - Methotrexate: increase MTX concN
  - Probenecid: decrease penicillin excretion
  - Allopurinol: increases risks of rash occurring
  - Warfarin : flucloxacillin & dicloxacillin decrease anticoagulant effect of warfarin
  - Voriconazole: flucloxacillin may decrease voriconazole concN
- **ADR [common]:** immunological reactions
  - [rare]: black hairy tongue

Generic name
Amoxicillin
Amoxicillin + Clavulanate acid
Ampicillin
Benzylpenicillin
Dicloxacillin
Flucloxacillin
Phenoxymethylpenicillin

Common ADR
Diarrhea, nausea, pain and inflammation at injection site (less common with benzylpenicillin), superinfection (including candidiasis) especially during prolonged treatment with broad-spectrum penicillin, allergy

Cephalosporins

- **MOA:** Interfere with bacterial cell wall peptidoglycan synthesis
- **Drug interactions**
  - **Probenecid:** prolongs activity of cephalosporins
- **ADR [common]:** immunological reactions

Generic name
Cefaclor
Cefalexin
Cefazolin
Cefapime
Cefotaxime
Cefoxitin
Ceftaroline
Ceftazidime
Ceftriaxone
Cefuroxime

Common ADR
Diarrhea, nausea, vomiting, pain and inflammation at injection site, rash, headache, dizziness, allergy, Clostridioides difficile-associated disease, superinfection (including Candida and Enterococcus spp., especially with broader-spectrum cephalosporins and prolonged treatment)

Lincosamides

- **MOA:** Interfere with bacterial cell wall peptidoglycan synthesis by binding
- **Drug interactions**
  - Lincosamides may prolong action of non-depolarising neuromuscular blockers
- **ADR [rare]:** taste disturbances

Generic name
Clindamycin
Lincomycin

Common ADR
Diarrhea (mild-to-severe), nausea, vomiting, abdominal pain or cramps, rash, itch, contact dermatitis (with topical use)

Metronidazole

- **MOA:** Metabolised to active metabolites that are thought to interfere with DNA synthesis
- **Drug interactions**
  - Alcohol: disulfiram like reaction
  - Busulfan: increase busulfan concN
  - Disulfiram: confusion & psychotic reactions
  - Fluorouracil: increase FU concN
  - Phenobarbital: reduce concN of metro.
  - InH metabolism of Warfarin
- **ADR [common]:** metallic taste
  - [infrequent]: furry tongue, glossitis, stomatitis, oral mucositis

Generic name
Metronidazole

Common ADR
Nausea, anorexia, abdominal pain, vomiting, diarrhea, metallic taste, CNS effects (eg dizziness, headache), thrombophlebitis (IV)

Tetracyclines

- **MOA:** Broad-spectrum, bacteriostatic antibiotics
  - Inhibit protein synthesis via 30S ribosomal subunit
- **Drug interactions**
  - **Anticoagulants**: Tetracyclines can lower plasma prothrombin activity
    → May require reduced anticoagulant dose (e.g., warfarin)
- **Dental implications**
  - Binds calcium → incorporated into developing teeth
  - Causes permanent discoloration (yellow-grey/brown bands)
  - Affects enamel formation, increases susceptibility to decay

Generic name
Demeclocycline Doxycycline Minocycline Tetracycline

Common ADR
Gastrointestinal symptoms and hypersensitivity reactions such as rashes and photosensitivity. Long-term use can cause superinfections. Doxycycline may irritate the esophagus if taken improperly, potentially leading to ulcers.

Therapeutic guidelines

- **Management of Odontogenic Infections**
- **Primary treatment**: Always address the source (e.g. extraction, root canal, periodontal debridement); antibiotics do **not** replace dental treatment
- **Localized infections** (no facial swelling/systemic signs):
  - Include periapical, peri coronal, and periodontal abscesses
  - Present as dental pain, pus, or gum swelling
  - Treat with dental procedures to drain pus—antibiotics usually **not required**
  - If treatment is delayed >24h or fragments remain post-extraction, start antibiotics
  - Provide analgesia and warm saline or chlorhexidine rinses for peri coronal infections

Therapeutic guidelines

- **When to Refer or Prescribe Antibiotics**
  - Refer patients promptly to a dentist if presenting to a medical practitioner
  - Begin antibiotics **only** if dental treatment is delayed >24h or systemic signs are present
  - Recurrent infections despite antibiotics indicate missed dental intervention—seek expert advice
  - Common pathogens are polymicrobial; **amoxicillin + clavulanate** is effective monotherapy
  - Combine **metronidazole** with **penicillin** if anaerobic coverage needed

Therapeutic guidelines

- **Spreading Odontogenic Infections (No Severe/Systemic Features)**
  - Can be managed outpatient with:
    - Drainage of pus
    - Source control via dental treatment
    - Antibiotics started after culture, if possible
  - Local anaesthesia may fail; consider sedation or GA
  - Analgesia is essential
  - Reassess at 48–72 hours—adjust antibiotics based on culture, check for unresolved abscesses via CT
  - Escalate care if not improving or worsening

Therapeutic guidelines

- **Indication:** spreading odontogenic infection w/o severe/systemic features, infection following dentoalveolar surgery
- **Metronidazole 400 mg** (child: 10 mg/kg up to 400 mg) orally, 12-hourly for 5 days
- PLUS EITHER
  - **Phenoxymethylpenicillin 500 mg** (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days

  OR
  - **Amoxicillin 500 mg** (child: 15 mg/kg up to 500 mg) orally, 8-hourly for 5 days
- **OR (as a single preparation)**
  - **Amoxicillin + clavulanate 875+125 mg** (child 2 months or older: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly for 5 days
- **OR (penicillin hypersensitivity): clindamycin 300 mg** (child: 7.5 mg/kg up to 300 mg) orally, 8-hourly for 5 days

Therapeutic guidelines

- **Spreading Infection with Severe or Systemic Features**
  - Urgently transfer to hospital with oral/maxillofacial support
  - Symptoms: facial swelling, trismus, dysphagia, dyspnoea, fever >38°C, pallor, sepsis signs
  - Airway management, IV fluids, pus drainage, and surgical source control are critical
  - Collect cultures before starting antibiotics—do not delay treatment
- **AB Regimen (IV)**
  - **Benzylpenicillin IV + metronidazole IV**
  - **OR Amoxicillin + clavulanate IV** (dose based on weight and ICU status)
  - **Penicillin allergy**:
  - **Non-severe**: cefazolin + metronidazole
  - **Severe**: clindamycin monotherapy
  - Switch to oral therapy once clinically stable, drains are dry, and patient is afebrile

Therapeutic guidelines

- **Postoperative Dental Infections**
  - Rare; exclude dry socket and inflammation before diagnosing infection
  - Symptoms: cellulitis, purulent discharge, persistent/worsening pain after 48h
  - Mild infections: manage with drainage, fragment removal, analgesia, rehydration
  - Add antibiotics only if systemic features or immunocompromised
  - Use same oral regimens as for spreading odontogenic infections
  - Review at 48–72 hours to assess response

Therapeutic guideline: periodontal

- **Gingivitis:** not indicated
- **Periodontitis:** rarely indicated
- **Necrotizing gingivitis:** metronidazole 400 mg orally, 12-hourly for 3 to 5 days
- **Periodontal abscess:** treat as spreading odontogenic infections only in profound immunocompromised
- **Peri-mucositis:** not indicated
- **Peri-implantitis:** amoxicillin 500 mg orally, 8-hourly PLUS metronidazole 400mg orally, 12-hourly for 7 days

Antibacterials: prophylaxis

- **Indications**
  - Surgical: rarely indicated, role of surgical antibiotic prophylaxis for patients with profound immune compromise who are undergoing an invasive dental procedure is uncertain
  - Infective endocarditis: in patients w/ specific cardiac conditions
- **Not indicated**
  - Prevention of alveola osteitis
  - Tooth extractions
  - Third molar surgery
  - Procedures involving insertion of dental implants
  - Periodontal surgery
  - Periapical surgery
  - Soft and hard tissue removal

Infective endocarditis Prophylaxis

Figure 2.40 Cardiac conditions for which endocarditis prophylaxis is recommended for patients undergoing a procedure listed in the figure below

Endocarditis prophylaxis is recommended only for patients with the following cardiac conditions (that are associated with an increased risk of developing infective endocarditis and the highest risk of adverse outcomes from endocarditis) who are undergoing a procedure listed below [NB1] [NB2]:

- prosthetic cardiac valve, including transcatheter-implanted prosthesis or homograft
- prosthetic material used for cardiac valve repair, such as annuloplasty rings and chords
- previous infective endocarditis
- congenital heart disease *but only* if it involves:
  - unrepaired cyanotic defects, including palliative shunts and conduits
  - repaired defects with residual defects at or adjacent to the site of a prosthetic patch or device (which inhibit endothelialisation)
- rheumatic heart disease [NB3].

NB1: Endocarditis prophylaxis is not recommended for patients with forms of valvular or structural heart disease not listed in this box, including patients with mitral valve prolapse, septal defects or cardiac implantable electronic devices.

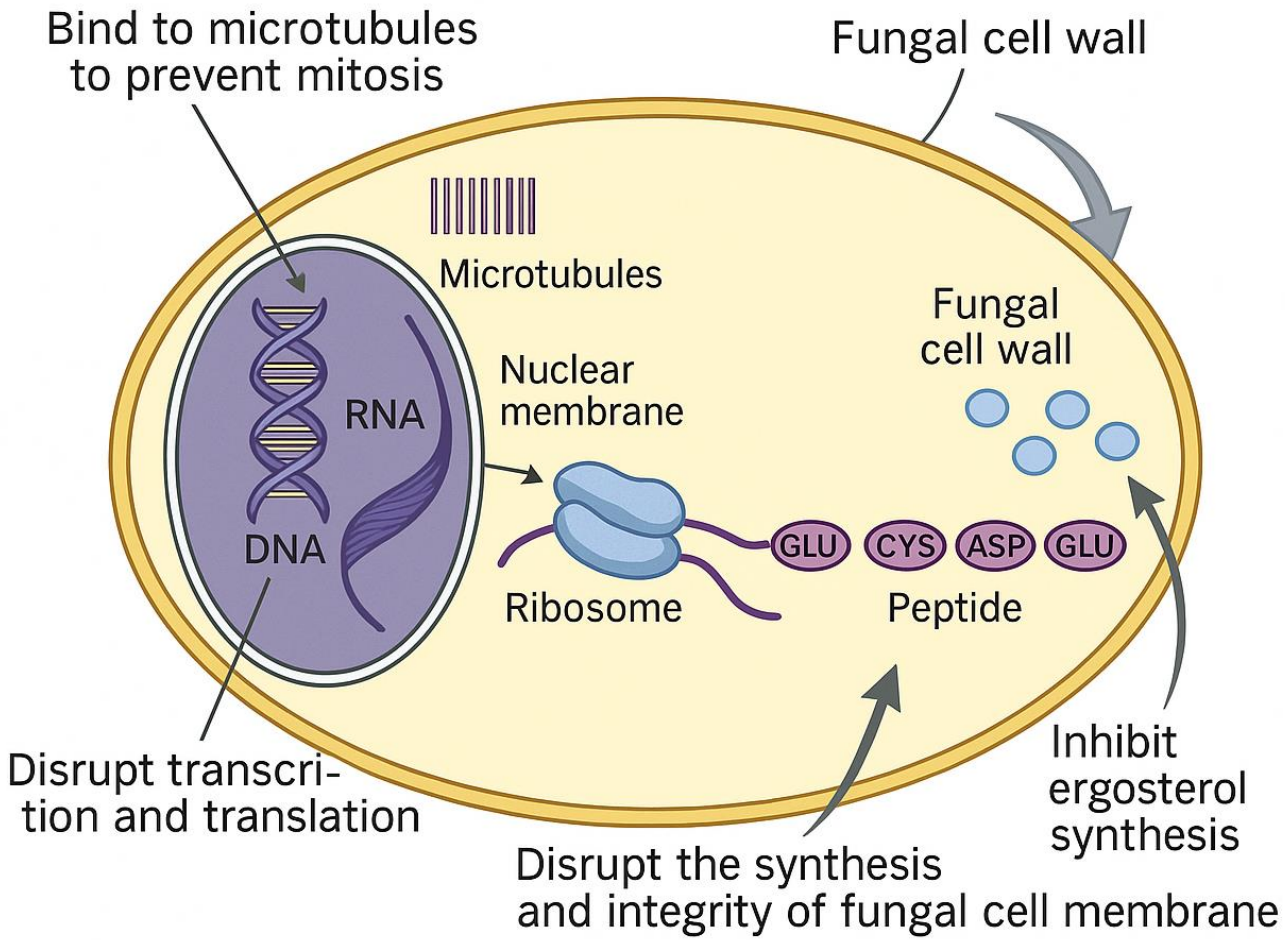
NB2: Patients with a heart transplant who have developed cardiac valvulopathy may also be at high risk of adverse outcomes from endocarditis; consult the patient's cardiologist for specific recommendations.

NB3: See text below for discussion of patients with rheumatic heart disease.

Antibacterials: prophylaxis

- **Infective endocarditis**
- **Endocarditis prophylaxis only for patients with a cardiac condition(s)**
  - **Dental procedures —**only those involving manipulation of the gingival or periapical tissue or perforation of the oral mucosa (eg extraction, implant placement, biopsy, removal of soft tissue or bone, subgingival scaling and root planning, replanting avulsed teeth)
- **Drug regimen**
  - **[oral]** amoxicillin 2 g (child: 50 mg/kg up to 2 g) orally, 60mins before procedure
  - **Delay non severe penicillin hypersensitivity:** Cefalexin 2 g (child: 50 mg/kg up to 2 g) orally, 60 mins before procedure
  - **Immediate (severe or non-severe) or delayed severe hypersensitivity to penicillins:** clindamycin 600 mg (child: 20 mg/kg up to 600 mg) orally, 60 to 120 minutes before the procedure

Antifungals



Antifungals

Organism	Azoles	Echinocandins	Amphotericin B	Flucytosine	Griseofulvin	Terbinafine
Yeasts	Susceptible	Susceptible	Susceptible	Susceptible	Resistant	Varying susceptibility
Dermatophytes	Susceptible	No data	No data	No data	Susceptible	Susceptible
Dimorphic moulds	Susceptible	No data	Susceptible	Resistant	Resistant	Susceptible
Moulds	Fluconazole resistant	Varying susceptibility	Varying susceptibility	Mostly Resistant	Resistant	Varying susceptibility
Mucorales	Fluconazole & itraconazole resistant	Resistant	Susceptible	Resistant	Resistant	Resistant

Azoles

- **MOA:** Azoles impair the synthesis of ergosterol in fungal cell membranes leading to their breakdown
- **Drug interactions**
  - Many drug interactions
  - Remember all our drug interactions because these are CYP3A4 inhibitors
- **Oral candidiasis:** fluconazole, miconazole
- **Oral candidiasis in immunocompromised or other tx failed:** itraconazole, ketoconazole, posaconazole, voriconazole

Generic name
Fluconazole
Itraconazole
Ketoconazole (only thru SAS)
Miconazole
Posaconazole
Voriconazole

Common ADR
Rash, headache, dizziness, nausea, vomiting, abdominal pain, diarrhoea, elevated liver enzymes

Drug	Indication	Dosing Regimen
Fluconazole	Oropharyngeal/ esophageal candidiasis	*Oral/IV*, 50–200 mg once daily (the lower doses are usually used for oropharyngeal candidiasis). Up to 400 mg once daily can be used in oesophageal candidiasis. Treat for 7–14 days in oropharyngeal candidiasis and for 14–21 days in oesophageal candidiasis.
Miconazole	Oropharyngeal candidiasis	*Adult, child >2 years*, oral, half a spoonful (2.5 mL) using the measure provided 4 times daily (for 7–14 days for treatment). *Birth (at term) – 2 years*, oral, quarter of a spoonful (1.25 mL) using the measure provided 4 times daily (for 7–14 days for treatment)
Itraconazole	Oropharyngeal/ oesophageal candidiasis in immunocompromised	*Oral liquid*, 200 mg daily. Treat oropharyngeal candidiasis for at least 7–14 days and oesophageal candidiasis for 14–21 days. *50 mg capsule (Lozanoc®)*, 50–100 mg once daily for 28 days. *100 mg capsule (eg Itracap®)*, 100–200 mg once day
Posaconazole	Oropharyngeal candidiasis nf immunocompromised	*Oral liquid*, 200 mg once daily for 1 day, then 100 mg once daily. *Refractory to fluconazole or itraconazole*, oral liquid 400 mg twice daily.

Echinocandins

- **MOA:** inhibiting synthesis of 1,3-beta-D-glucan in the fungal cell wall
- **Drug interactions:** limited data
- Invasive candidiasis
- Caspofungin & Micafungin are also indicated for oesophageal candidiasis

Generic name
Anidulafungin inj
Caspofungin inj
Micafungin inj

Common ADR
Nausea, vomiting, diarrhoea, rash, hypokalaemia, increased liver enzymes, injection site reactions (uncommon with anidulafungin)

Other

- **Amphotericin B:** oral & perioral candidiasis [10mg qid 7-14 days]
  - **Drug interaction:** Azoles (antagonistic effect)
- **Nystatin:** oropharyngeal candidiasis
  - Adult, child, oral liquid 100 000 units 4 times daily for 7–14 days for treatment. Higher doses, e.g. 500 000 units 4 times daily, can be used
- **Terbinafine:** fungal skin infections (including head and neck region)
  - **Drug interaction**
    - inH metabolism of tramadol to the active metabolite
    - inH metabolism of some TCAs → increase ADR
    - Rifampicin increases the metabolism of terbinafine → reduce antifungal effect

Generic name
Amphotericin B
Flucytosine
Griseofulvin
Nystatin
Pentamidine inj
Terbinafine

Antivirals

- Viruses are non-cellular, obligate intracellular parasites
- Cause diseases like influenza, herpes, hepatitis, and HIV/AIDS
- Made of DNA/RNA in a protein shell (lack cytoplasm or membranes)
- Replicate by hijacking host cell machinery
- Hard to treat without harming host cells
- Antivirals aim for **selective toxicity**—target viral-specific enzymes or replication steps

Antivirals

Class	Drug	Primary indications
guanine analogues	aciclovir, famciclovir	herpes simplex, shingles
	valaciclovir	herpes simplex, shingles, CMV
	ganciclovir, valganciclovir	CMV
neuraminidase inhibitors	oseltamivir, peramivir, zanamivir	influenza A and B
HCV NS3/4A inhibitors	glecaprevir, voxilaprevir	hepatitis C
HCV NS5A inhibitors	ledipasvir, pibrentasvir, velpatasvir	
HCV NS5B nucleotide inhibitors	sofosbuvir	
other antivirals	amantadine	influenza A
	adefovir, entecavir, peginterferon alfa-2a	hepatitis B
	cidofovir, foscarnet, letermovir, maribavir	CMV
	nirsevimab, palivizumab	respiratory syncytial virus
	molnupiravir, nirmatrelvir and ritonavir, remdesivir	coronavirus disease 2019 (COVID-19)
	ribavirin	hepatitis C

Guanine Analogues

- **MOA:** inhibit viral DNA polymerase and DNA synthesis
- **Drug interactions**
  - Impair renal excretion of mycophenolate
  - Probenecid impair renal secretion of guanine analogues
- **ADR:** check individual monograph

Generic name
Aciclovir
Famciclovir
Ganciclovir
Valaciclovir
Valganciclovir

Drug (brand)	Indication & drug regimen	Selected ADR
Aciclovir (Aciclovir)	**Orolabial herpes simplex** Oral 400 mg 5 times daily for 5 days in selected cases, eg severe infection, immunocompromised patient. A dose of 400 mg 3 times daily for 5–10 days can be used in HIV infection	[infrequent] vertigo, dizziness, sore throat
Famciclovir (Famvir)	**Recurrent orolabial herpes simplex** [immunocompetent adult]: Oral, 1500 mg as a single dose in selected patients, eg with severe infection [immunocompromised adult]: Oral, 500 mg twice daily for 5–10 days in HIV patients	[infrequent] confusion in elderly, dizziness
Ganciclovir (Cymevine inj)	Not dental related	[infrequent] mouth ulceration, dry mouth, drowsiness
Valaciclovir (Valtrex)	**Recurrent oral labial herpes simplex** Oral, 2 g every 12 hours for 2 doses in selected patients, eg with severe infection. HIV-positive, oral 1 g twice daily for 5–10 days. Prevention, immunocompromised, oral 500 mg twice daily	[infrequent] vertigo, dizziness, sore throat
Valganciclovir	Not dental related	[common] oral candidiasis, cough, headache, dizziness

Antimalarial

- Caused by *Plasmodium* via mosquito bite
- *P. falciparum* is most dangerous
- Not endemic in Australia/NZ, but travel-related cases occur
- Risk of local spread in northern Australia
- Affects liver → red blood cells → fever, chills
- Relapses possible with *P. vivax*/*P. ovale*
- Relevant due to drug interactions & medical history

Anti-protozoals: Antimalarials

Drug	Prophylaxis of malaria	Treatment of malaria[1]
artemether with lumefantrine	no	first line for uncomplicated malaria[2]
artesunate (SAS)	no	first line for severe malaria
atovaquone with proguanil	yes	alternative for uncomplicated malaria[2]
clindamycin	no	used with quinine for uncomplicated malaria[2]
doxycycline	yes	used with quinine for uncomplicated malaria[2]
mefloquine	yes	chloroquine-resistant malaria[2]; due to risk of severe neuropsychiatric effects, use only when other options are not available or unsuitable (seek specialist advice)
primaquine	no	used to eradicate liver stages of *P. vivax* or *P. ovale* malaria to prevent relapse months or years later
quinine	no	used with clindamycin or doxycycline as an alternative for uncomplicated malaria[2]; used for severe malaria if artesunate is unavailable
tafenoquine	yes	used to eradicate liver stages of *P. vivax* or *P. ovale* malaria to prevent relapse months or years later

[1] a drug used for prophylaxis should not be used as treatment

[2] for *P. vivax* or *P. ovale* malaria, add primaquine or tafenoquine (confirm G6PD status before starting treatment)

Other

- **[Atovaquone]**
- **MOA:** inhibit protozoal mitochondrial electron transport
- **Drug interactions**
  - Impair renal excretion of mycophenolate
  - Probenecid impair renal secretion of guanine analogues
- **ADR:** check individual monograph

Generic name
Atovaquone
Metronidazole
Paromomycin *SAS*
Pyrimethamine *SAS

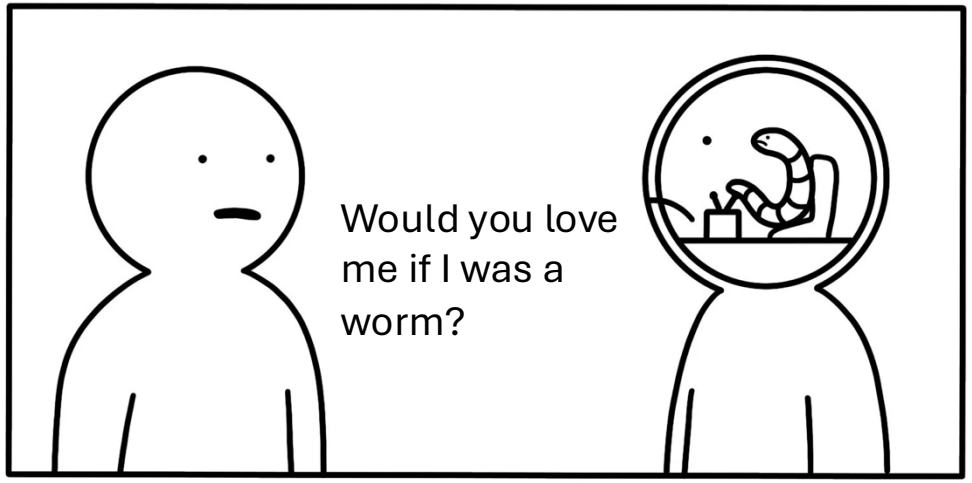
This drug is not marketed in Australia but may be available through the SAS

Antihelmintics

Worm Infestations (Helminthiasis)

• Caused by helminths *e.g. Nematodes, trematodes, cestodes*

• Complex life cycles, some require intermediate hosts



Anthelmintic Treatment

• Drugs disrupt energy metabolism, neuromuscular function, or membrane permeability

• Mechanisms lead to paralysis or death of the worm

• Rare in Australia/NZ, but important for patients with relevant travel history

Antihelmintics

Drug	Pregnancy	Breastfeeding	Children	Adverse effects
Benzimidazoles				
albendazole	avoid use	appears safe	may use if >6 months	well tolerated
mebendazole	avoid in first trimester	may use	may use if >6 months	well tolerated
Other anthelmintics				
ivermectin	avoid use	may use	may use if >5 years and/or >15 kg	mild adverse effects when used for strongyloidiasis
praziquantel	appears safe	safe	may use	well tolerated in short courses
pyrantel	safe	safe	may use	well tolerated

Benzimidazoles

- **MOA:** Inhibit microtubule polymerisation by binding to beta tubulin in parasite
- **Drug interactions:** not dental related
- **ADR [common]:** headache

Generic name	Brand Name
Albendazole	Zentel
Mebendazole	Combantrin

ADR
Common or infrequent headache, nausea, vomiting, diarrhoea, abdominal pain, increased liver function tests, dizziness, fever **Infrequent or rare** hypersensitivity (itch, rash, urticaria), alopecia, bone marrow depression, hepatitis

Other

- **Ivermectin (also in dermatological lecture)**
  - **MOA:** binding to glutamate-gated chloride ion channels and acting as a GABA agonist in parasite
  - **ADR:** fatigue, dizziness
- **Praziquantel**
  - **MOA:** depending on concN can increase muscular activity or cause integumental damage
  - **ADR:** dizziness, drowsiness
- **Pyrantel**
  - **MOA:** depolarising neuromuscular blocking agent
  - **ADR:** headache

Generic name
Ivermectin
Praziquantel
Pyrantel

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