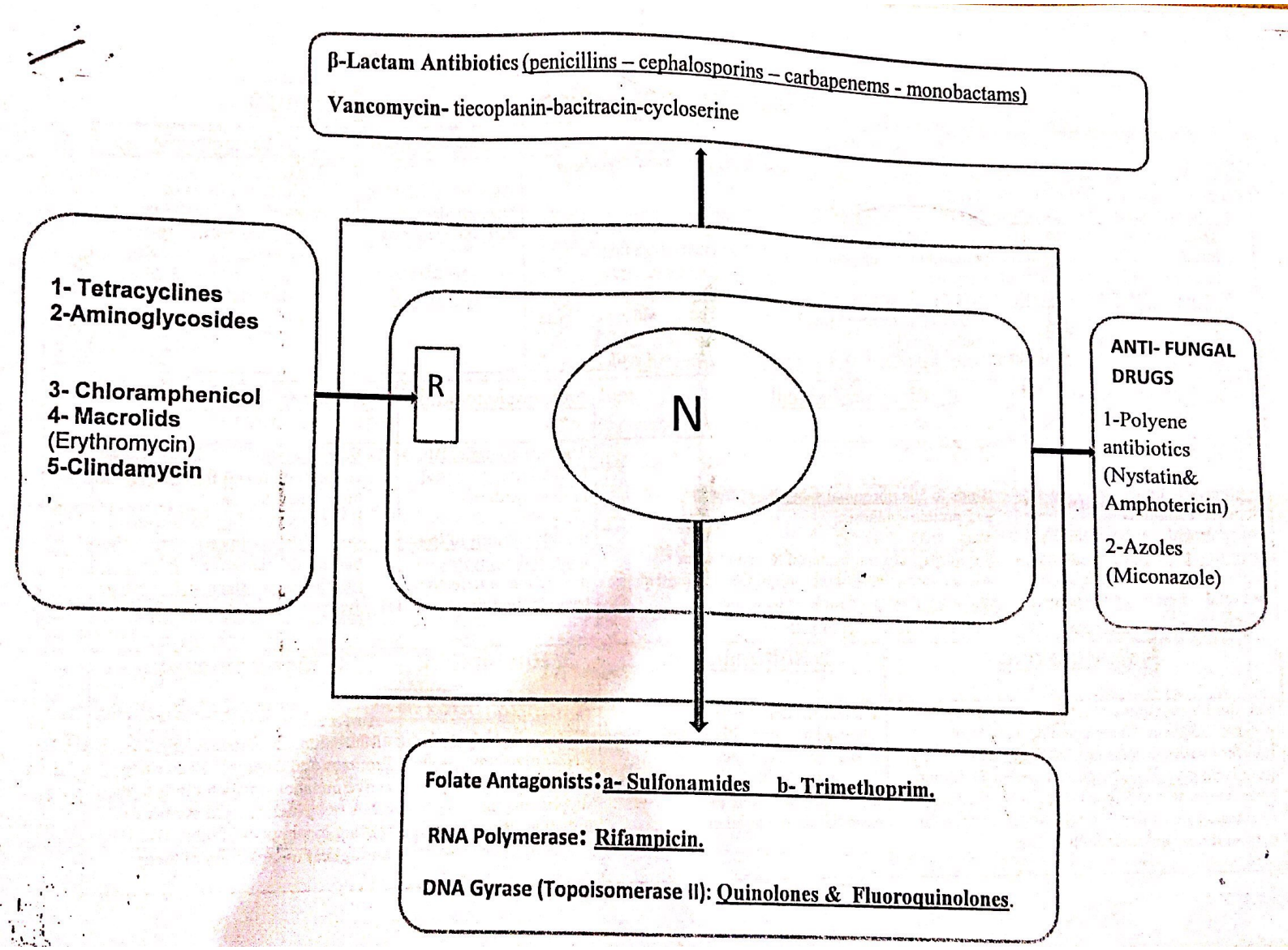


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Mechanism of action

1. Penicillins	2- Cephalosporins	3-Vancomycin
Penicillins are **bactericidal** by inhibiting bacterial cell wall synthesis and affect micro-organisms during their growth (formation of cell wall) via: **1. INHIBITION OF TRANSPEPTIDATION REACTION:** Thus hindering formation of cross links essential for cell wall integrity. This action is through binding of penicillin to penicillin binding proteins (PBPs) on bacteria leading to inhibition of bacterial cell wall synthesis. **2. DESTRUCTION OF EXISTING CELL WALL BY AUTOLYSINS.** Autolysins are autolytic enzymes produced by bacteria (mainly gram +ve cocci) which participate in the normal remodeling of bacterial cell wall. **Penicillins ↑ ACTIVITY OF THESE AUTOLYSINS → Lysis of bacterial cell wall.**	As penicillin, Bactericidal & ↓ cell wall synthesis.	• Bactericidal. • Inhibits synthesis of **bacterial cell wall** by action on **peptidoglycan polymerization at a site earlier** than that inhibited by B-lactam antibiotics (2nd step).

1. Tetracyclines	2. Chloramphenicol	Aminoglycosides	4. Macrolide antibiotics
Bacteriostatic: **Inhibition of protein synthesis:** binds to 30-s ribosomal subunits concentrated in bacteria by **specific transport** proteins (energy dependent) unique to bacterial inner cytoplasmic membrane.	- Bacteriostatic, may be bactericidal - Binds to 50s ribosomal subunit →↓ transpeptidation →↓ protein synthesis. - Similarity between bacterial & mammalian mitochondrial ribosomes → inhibition of protein synthesis in mitochondria → bone marrow depression. **(In large doses).**	They are bactericidal by inhibiting bacterial protein synthesis. They bind to sites on the **30s subunit of the bacterial ribosome** → production of defective bacterial proteins.	1. Bacteriostatic in low concentration and bactericidal in high concentration. 2. Bind irreversibly to a site on the 50s subunit of the bacterial ribosome, inhibiting translocation steps of protein synthesis.

1. Quinolones	2-Sulfonamides	3. Rifampicin	4- Metronidazole
The fluoroquinolones enter the bacterium by passive diffusion. Once inside the cell, they interfere with the action **of DNA gyrase** (topoisomerase II and topoisomerase IV) during bacterial growth and reproduction. So **they inhibit the supercoiling of DNA** which is necessary for normal transcription and replication.	**bacteriostatic.** They act as competitive antagonists of p-aminobenzoic acid **(PABA)** resulting **in inhibition of biosynthesis of folic acid** which is essential for bacterial growth.	**Bactericidal** ⇩ DNA-dependent RNA polymerase → ⇩ **mRNA synthesis** by suppressing the initiation steps	**- Amebicidal** - Metronidazole is reduced by Protozoa and Anerobic Bacteria to active metabolite which binds to their DNA →↓ **Nucleic Acid synthesis** leading to stopping of their multiplication & killing of them

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chemo side effects

1. Penicillins	2- Cephalosporins	3 Carbapenems	4-Vancomycin
1. Hypersensitivity reaction (5%): more common with parenteral preparations. Major cause is penicilloic acid which reacts with protein and serves as hapten to cause immune reaction (urticaria, angioedema, anaphylaxis). Cross allergy with B-Lactam antibiotics may occur. **2. Irritant:** IM injection →local pain, induration, IV injection→ thrombophlebitis. **3. Diarrhea:** Malabsorption of oral Penicillins → disruption of normal balance of intestinal microorganisms → super infection. **4.High concentrations** are toxic to CNS→ seizures **5.Acute interstitial nephritis** with methicillin **6-Platelets dysfunction and↓ agglutination** with anti-pseudomonal & penicillin G. **7-Jarisch-Herxheimer reaction in patients with syphilis:** → fever + exacerbation of local syphilitic lesions after the first injection of penicillin due to massive destruction of treponema pallidum	**1. Hypersensitivity:** - Less than penicillin. Skin rash,bronchospasm,fever, anaphylaxis. - Cross sensitivity with penicillin. **2. Irritant:** IM → Pain at the site of injection. IV→thrombophlebitis. **3. Diarrhea,** gut upset, super infection with oral. **4.Nephrotoxicity:** - Potentiated by diuretics, as thiazides & Nephrotoxic agents as gentamycin or tobramycin & NSAID. - Renal tubular necrosis with cephaloridin. **5. Bleeding** .due to anti-Vit K effect and platelet dysfunction may occur	**1-Allergy & cross allergy with penicillins.** **2-nausea, vomiting, and diarrhea.** **3-Esinophilia and neutropenia** **4-seizures, but meropenem is less likely to do so.**	**1-Fever,** chills. **2-Phlebitis** at the infusion .site. **3-Flushing (red man syndrome)and shock** result from histamine release due to rapid infusion. **4-Nephrotoxic,** (creatinin level should be measured) **5-Hearing loss: (Ototoxicity)** Dose related in patients with renal failure who accumulates the drug.

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1. Tetracyclines

1-Teeth & bone abnormalities: as they chelate Ca^{++}.
Staining,dental hypoplasia bone deformities
2-Teratogenesis.

3-GIT irritation:
4-Superinfection with Candida:
in Vagina, intestine.
5-Inhibition of intestinal flora: vit B & K deficiency.

6-Hepatotoxicity:
- during pregnancy.
- Large doses taken IV.

7-Phototoxicity:
8-Nephrotoxicity:
specially if used after the expiry date
Fanconi syndrome:

2.Chloramphenicol

1-Bone marrow depression:
Aplastic anemia:
Reversible anemia.
Hemolytic anemia

2-Gray baby syndrome: in premature babies due to defective conjugation

3-GIT upsets:
superinfection (overgrowth of Candida on m.m.) & vit K & B def.

4-Drug interactions
→↓ HME →↑ level of warfarin & phenytoin

3. Aminoglycosides

1-Ototoxicity:
The toxicity affects both the auditory ad vestibular divisions of the **8th cranial nerve.**
The result is usually irreversible with a higher incidence with long term use.
- The **vestibular branch** is affected mostly by streptomycin, gentamicin and tobramycin.
- The **auditory branch** is mostly affected by neomycin, kanamycin, amikacin.

2-Nephrotoxicity: Aminoglycosides accumulate in the kidney in high concentration and are potentially nephrotoxic **specially neomycin** and **gentamicin.**
Neomycin is **never** used systemically.

3-Neuromuscular blockade: Paralysis of the diaphragm may occur following instillation of aminoglycosides into the pleural or peritoneal cavities (as occurs during certain surgical procedures). The blockade is **curare like in nature.** It is due to inhibition of Ca^{++} uptake necessary for the exocytotic release of acetyl choline.

4-Allergic manifestation: e.g.contact dermatitis

4. Macrolide antibiotics

1-Epigastric pain and diarrhea (most common).

2-Cholestatic jaundice
especially with esteolate ester (not to be given in liver disease).

3-Hypersensitivity reaction & skin rash.

4Ototoxicity
especially with azithromycin.

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chemo side effects

1. Quinolones	2. Sulfonamides	3. Rifampicin	4- Metronidazole
1-GIT disturbances:. 2-Confusion,headache, dizziness. 3-Photosensitivity:. 4-Hypersensitivity: 5-Hepatotoxic effect. 6-Damage of growing cartilage→arthropathy **Contra-indicated in:** Pregnancy, Lactation Patients under 18 years old	1. Allergy (hypersensitivity): 2 .Blood: a. Hemolysis in patients with G6PD deficiency. b. Aplastic anemia, thrombocytopenia. 3. Crystalluria avoided by: a. Plenty fluid intake. b. Alkalinization of urine. 4. Drug interactions: a. Displace Warfarin → increase its activity. b. Displace bilirubin → Kernicterus in neonates. Avoid during pregnancy and lactation.	1-Red discoloration of urine & all secretions 2-Fever – Flue-like syndrome 3-Ataxia. 4-GIT disturbances and rash 5-Hepatotoxicity and jaundice 6-HME inducer → ⇧ metabolism → ⇩ action of other drugs e.g. Warfarin, oral hypoglycemics, narcotics, analgesics, estrogen contracetives	CNS: Headache, Dizziness, Vertigo GIT: Metallic Taste, Nausea, Vomiting Blood: Leucopenia With Alcohol: → Disulfiram-like effect

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Clindamycin

- Structurally related to Macrolides.

✧ **Mechanism of action:** Similar to erythromycin.

✧ **Spectrum of activity:** Similar to penicillin G and erythromycin+**Anaerobic infection**: Principal use Specially caused by bacteroides fragilis (Oropharyngeal infection Gastro-intestinal infection)

✧ **Uses:**

1. **Clindamycin is used in dentistry as alternative to amoxicillin in prophylaxis against infective endocarditis in those allergic to the latter drug.**
2. **Bone & teeth** infection (in treatment of severe dental infection, **Clindamycin is used IV** in a dose of 300-600 mg)
3. **Intra-abdominal anaerobic** infection: (bacteroides fragilis).
4. Locally in **acne Vulgaris**.
5. **Female genital tract infection** and **penetrating wounds** + Cephalosporins.
6. **Pneumocystis cranii pneumonia** + Primaquine (First choice co-trimoxazole).

✧ **Adverse effects:**

1. Skin rashes.
2. Colitis:

Fatal pseudomembranous colitis (clostridium difficile which elaborates toxins)Treated by **oral metronidazole or vancomycin**.

3. Liver function impairment
4. Intestinal disturbances-

Co-Trimoxazole

Combination of Trimethoprim (TMP) + Sulphamethoxazole

TMP : SMZ

1 : 5

- **Sulpha** acts by competitive antagonist to PABA resulting in inhibition of folic acid.
- **Trimethoprim** inhibits bacterial dihydrofolic acid reductase.
- Such combination produces **sequential block.**
- Such combination is **Cidal.**
- **Dose** 80 mg trimethoprim + 400 sulphamethoxazole 2 tablets/12 hours.
- **Used in:**
  1. **Co-trimoxazole may be used occacionally in the treatment of severe dental infections, and in sinusitis and sialadenitis**
  2. Urinary tract infections-prostatitis (as TMP concentrates in prostatic fluid).
  3. Respiratory infection as pneumonias-Otitis media.
  4. Typhoid fever.
  5. Pneumocystis cranii (pneumonia)
- **Main side effects**: (as sulphonamides) + Megaloblastic anemia + Leucopenia (Trimethoprim is anti-Folate).
- **Contraindications:**
  1. Infant under 2 months due to increase risk of **kernicterus.**
  2. Pregnancy and lactation due to increase risk of kernicterus.
  3. Creatinine clearance less than 15 ml/min.

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I. NHIBITORS OF BACTERIAL CELL WALL SYNTHESIS

β-Lactam Antibiotics

1. Penicillins

☆ Preparations of penicillins:

I.Benzyl penicillin (Penicillin G)

Has the following disadvantages:

1-**Short** duration of action (4-6 hours).
2-Destruction by **gastric acidity.**
3-Inactivation by **B - lactamase.**
4-**Restricted spectrum** of activity

II. Long acting penicillin preparations:

Usually suspensions. So given IM, **never IV.** Relatively H2O insoluble &so slowly absorbed→low but sustained concentrations in blood.

They include:

1. **Procaine penicillin G:** Procaine + benzyl penicillin.
2. **Fortified procaine penicillin:**
   • Benzyl penicilli (Rapid absorption + High peak blood level) + procaine penicillin (slow absorption +low steady blood level)
3. **Benzathine penicillin:**

Low level in blood for long period (few days to 4 week) depot form
Not used in acute Infections.
Given IM 1.2 million units/4 weeks in prophylaxis of rheumatic fever

III.Acid resistant penicillins:

Phenoxymethyl penicillin (penicillin V).

IV.Penicillinase resistant Penicillins:

- **Methicillin: (IM)**

Some strains of staph become resistant to methicillin (MRSA). So used to diagnose methicillin resistant staph-aureus (MRSA)

V. Acid & Penicillinase resistant Penicillins:

-Oxacillin, cloxacillin, dicloxacillin,flucloxacillin orally

Nafcillin:

INCOMPLETE ABSORPTION from the GIT
So (IM) → HIGHER LEVEL IN BLOOD & QUICK ACTION.
Excreted in bile →**enterohepatic circulation** →PROLONGED DURATION.

VI. Broad spectrum penicillins:

1. Ampicillin:	2. Amoxycillin
- Acid resistant → so taken **orally.** - Affected by food. - More effective than benzyl penicillin against Gram –ve organisms. - 250 mg-1 g/6 hours oral, IM,IV.	- **Better** absorbed than ampicillin. → Higher blood level. - Less GIT disturbance than ampicillin - 250-500 mg/8 h oral, IM,IV.

VIIAntipseudomonal penicillins:Extendedspectrum penicillins

1. Carboxypenicillins:	2. Ureidopenicillins:
CARBENICILLIN: Wide-spectrum: Taken IV Against Pseudomonas & proteus. Combined with gentamycin (Delay resistance,synergism) but not in same syringe.	**Ticarcillin and Piperacillin** IV **(acid sensitive)** They also act against **Klebsiella pneumonia** **Penicillinase sensitive** so can be combined with beta-lactamase inhibitors e.g. Piperacilliin + tazobactam. Used in **ANAEROBIC INFECTIONS.**

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☆. β-Lactamase inhibitors:

1-**Hydrolysis** of the β-Lactam ring, either by enzymatic cleavage with **a β-lactamase or by acid**, destroys the antimicrobial activity of β-Lactam antibiotics.

2-β-lactamase inhibitors, such as **clavulanic acid, sulbactam, and tazobactam**, contain a β-Lactam ring but by themselves, do not have significant antibacterial activity.

3-Instead, **they bind to and inactivate β-lactamases**, thereby **protecting the antibiotics** that are normally substrates for these enzymes.

4-Examples: Sulbactam + Ampicillin = **Unasyn** (Oral, i.m. i.v.) Clavulanic acid + Amoxicillin = **Augmentin** orally

☆ *Pharmacokinetics:*

1-Most of the penicillins are **incompletely absorbed** after oral administration, **amoxicillin** is almost **completely** absorbed. Absorption of all the penicillinase-resistant penicillins is **decreased by food** in the stomach.

2- Penicillins penetrate the cerebrospinal fluid (C.S.F) only with difficulty unless **inflamed.** They cross the placental barrier but are **not teratogenic**

3-

4- Excretion is mainly renal through an **active tubular secretory** mechanism. **Probenecid** can block this mechanism and so prolongs the action of penicillin.

☆ *Uses of penicillin:*

☆ *Adverse reactions*

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2- Cephalosporins

β-Lactam antibiotics & there Anti-bacterial activity is similar to penicillin but more resistant to β-lactamase

☆ ***Classification:*** Based on their bacterial susceptibility, resistance to β-lactamase and penetration into CSF:

First Generations	Second Generation	Third Generation	Fourth Generation
Spectrum:			
Broad spectrum. Active mainly Against gram +ve organisms Do not pass BBB	Broad spectrum. Similar to 1st generation but less active on Gram +ve & more on gram – ve Do not pass BBB	Broad spectrum similar to 2nd generation but less on gram +ve & more on Gram –ve bacilli and anaerobes pass BBB	Similar to 3rd generation but more resistant to β-lactamase enzyme pass BBB.
Preparations:			
Oral: Cephalexin Cephadroxil Cephradine **Parenteral:** Cephapirin Cephazoline Cephradin	**Oral:** Cefaclor Cefprozil Cefuroxime **Parenteral:** Cefuroxime Cefamandole Cefoxitin : anaerobe	**Oral:** Cefpodoxime **Parenteral:** Cefotaxime Ceftazidime Ceftriaxone Cefoperazone	**Parenteral:** Cefepime: excellent penetration to CSF

N.B.:

Excretion; as Penicillins except **cefoperazone & ceftrixaone are excreted through the bile** into the faeces used in patients with renal problems.

☆ ***Uses of Cephalosporins:***

☆ ***Adverse reactions:***

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3- Carbapenems (Imipenem, Meropenem)

1-Antibacterial spectrum: Imipenem/cilastatin and meropenem are **the broadest-spectrum** β-Lactam antibiotic preparations currently available against gram **+ve & -ve organisms, aerobes and anaerobes** organisms. So they are used in **hospital acquired infections** e.g. Nosocomial pneumonia

2-Pharmacokinetics: Imipenem and meropenem are administered IV, and penetrate well into body tissues and fluids, including the CSF when the meninges are inflamed. They are excreted by glomerular filtration.

3-Adverse effects :

N.B: Cilastatin (a dipeptidase inhibitor) added to Imipenem protect it from metabolism by renal dipeptidase enzyme.

Vancomycin

☆ ***Pharmacokinetics:***

- **Not absorbed orally** : only in (treatment of colitis)
- **Slow** IV infusion.
- **Metabolism** minimal **90-100% excreted** by glomerular filtration.
- Inflammation allows penetration into meninges.

☆ ***Uses:***

☆ ***Side-effects:***

N.B. Teicoplanin: Glycopeptide as vancomycin but **less potent, has no nephrotoxicity** so used in patients with renal troubles. It is effective in treatment of multiple drug resistant organisms

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II. INHIBITORS OF PROTEIN SYNTHESIS

1. Tetracyclines

a) Low to moderate lipid solubility	b) High lipid solubility
Preparations -Tetracycline -Oxytetracycline – chlortetracycline - Demeclocycline	• Doxycycline Minocycline
Kinetics **1. Incompletely absorbed orally:** • Affected by food. • Absorption is ↓ by: Milk, Ca, Mg, Fe & Al → chelation	**1. Completely absorbed orally:** • Not affected by food. • Absorption is ↓ by : Milk, Ca , Mg, Fe & Al → chelation
2. Distributed all over the body: • Pass placenta & BBB (levels are insufficient therapeutically) • Concentrated at sites of calcification (Bone, teeth & tumors which have high calcium)	**2. Distributed all over the body:** Minocycline: ttt of Meningococcal carrier but not infections.
3. Conjugated in liver.	**3. Conjugated in liver.**
4. Excretion: a-Mainly urinary b-Bile : Enterohepatic circulation c- Milk.	**a) Minocycline:** - Urine, bile. Milk, **b) Doxycycline.** - Excreted in bile - Allowed in renal pts.

☆ ***Mechanism of action:*** ☆ ***Spectrum:*** ☆ ***Uses:*** ☆ ***Side effects & toxicity:***

N.B. Tigecycline: new tetracycline derivative (glycyclines group) closely related to minocycline.
- Used in treatment of resistant severe infections as MRSA and enterococi
- Taken by injection and has a large volume of distribution

2. Chloramphenicol & Thiamphenicol

- Because of its high toxicity its use is restricted to life-threatening infectious in which there is no alternative.
- Taken either **oral** or **IV.** Distributed **all over the body.** Readily enters **normal CSF.**

☆ ***Mechanism of action:*** ☆ ***Spectrum:*** ☆ ***Therapeutic uses:*** ☆ ***Adverse effects:***

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3. Aminoglycosides

☆ **They include:**

Streptomycin, Gentamicin , Tobramycin , Kanamycin , Amikacin & Neomycin

☆ **Mechanisms of action:** ☆ **Spectrum of antibacterial activity:** ☆ **Side effects:**

☆ **Pharmacokinetic aspects:**

- They are **poorly absorbed from the intestine** because of their **highly polar nature**. When given orally their effect will be restricted to the GIT.
- For systemic effect should be given parenterally.
- They do not enter cells **(distributed extracellularly)**, do not cross the blood - brain barrier, **can cross placenta**.

5- Binding to plasma proteins is minimal (except streptomycin).

6- **Excreted unchanged in urine**. **In persons with impaired renal function** there is danger of drug accumulation and toxic effects.

4. Macrolide antibiotics

(Erythromycin - Clarithromycin - Azithromycin)

1. Erythromycin:

Obtained from streptomyces erythreus.

☆ **Pharmacokinetics:**

Unstable in acid medium → enteric coated

Esters stable: osteolate: orally, gluconate: IV

Distribution: (1) all over the body passes placental barrier but not B.B.B.
(2) Diffuses into prostatic fluid.

Metabolized in liver.

Excreted in bile → Enterohepatic Circulation

☆ **Mechanism of action:** ☆ **Spectrum:** ☆ **Uses:** ☆ **Averse effects:**

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Clarithromycin	Azithromycin
AS erythromycin but • Longer duration twice/day • Less side effects • Effective against. - **Haemophilus influenza** - **More** effective against Chlamydia ...ionella	• Longer duration once/day. • Less side effects & **not HME ↓** • Effective in respiratory infections due to haemophilus. • Preferred for Chlamydia but "coasty".

- **New Drugs:**
- **Linezolides (Zyvox):**
  - ↓ Protein synthesis by preve... formation of ... ribosome complex on 23S or 50S ribosomal subunit.
  - Is used for vancomycin-res... enterococcus ... tions: nosocomial pneumonia, community acquired pneumonia and skin infections.
  - Side effects: Thromboc... ...nia and neutropenia.

- **N.B. Sodium fusid... ...idic acid)**

Sodium fusidate ointm... ...ted in the Dental ... ...itioners' formulary, and may be applied to the fissures of angular cheilitis where Staph. aureus has ... ...isolated.

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Quinolones

☆ ***Members:***

First generation: Nalidixic acid

Second generation:

Ciprofloxacin , Norfloxacin

Ofloxacin

Third generation:

Levofloxacin, Moxifloxacin

Sparfloxacin

Fourth generation: Trovafloxacin

Second ,Third & Fourth generations are **fluoroquinolones**

☆ ***Pharmacokinetics:***

1-Absorbed orally.

Bioavailability 80-95%.

2-Distributed all-over the body and concentrated intracellular esp. prostatic tissue, Kidney, Macrophages and PMNLs, but low CSF levels.

3-Metabolized in liver.

4-Renal excretion: except: Moxifloxacin.

sulphonamides

1. Sulphonamides for systemic use

1. Rapidly absorbed:

a- Short acting:

- Sulphadiazine
- Sulohamerazine
- Sulphisoxazole

b- Long acting:

1- Sulphamethoxazole (SMX)

2- Sulphamethoxydiazine

2. Poorly absorbed:

- Sulphaguanidine
- Sulphathalidine
- Sulphasuxidine
- Sulphasalazine (Salazopyrine): Useful in ulcerative colitis and RA

2. Sulphonamides for topical use

Sulphacetamide: Eye drops for eye infections

- Silver Sulphadiazine: Skin cream

Mafenide for burns and wounds Skin cream and powder

☆ ***Pharmacokinetics:***

- The oral absorbable are classified as short and long acting on the basis of their half-lives. They are absorbed from the stomach and small intestine.
- distributed to tissues and body fluids including the CNS and CSF, placenta and fetus.
- Protein binding is high (from 20%-90%).
- Metabolism : **acetylation in the liver.**
- Excretion is renal by glomerular filtration.

Rifampicin

Kinetics:

Well absorbed orally

Distributed all over the body

Deacetylated in the liver

Excreted in

- Bile → Enterohepatic circulation
- Urine → red discoloration

Metronidazole

Kinetics:

Well absorbed from sites of administrations [Oral, Vaginal, Rectal]

Distributed all over the body

Passes into body fluids as saliva, Breast milk & vaginal secretion

Metabolized by the liver

Tinidazole:

As Metronidazole but used in a single oral dose.

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Use of systemic antibacterials in dentistry

Systemic antibacterials are used in dentistry for two purposes:

1. ***Therapeutically:*** in the management of an established infection. This can be as a definitive treatment, for example in the management of postoperative infection. Antibiotics may also be used as a supportive treatment to the surgical management of infection, such as in the treatment of large collections of pus or in the management of salivary gland infection secondary to a salivary calculus.
2. ***Prophylactically:*** to prevent the occurrence of infection.

Therapeutic use of antibacterials

- Antibiotics should not be prescribed without careful consideration of the **advantages over the disadvantages** of their use (around 10 people/year die in the UK as a result of penicillin allergy).
- **Antimicrobials are not analgesics**; patients in pain require pain-killing medication.
- The drugs most commonly used to treat dental infection are the **penicillins and metronidazole** (Their combination is useful in the management of severe dental infection).
- Patients **allergic to penicillin may be treated with either erythromycin or clindamycin**.

Prophylactic use of antibiotics

There are two quite different prophylactic uses for antimicrobials in dental practice.

1. ***Prevention of wound infection:*** **Oral Amoxcillin most commonly used**

2. ***Prevention of distant infection:*** as **infective endocarditis** in
   - *Patients with congenital abnormalities of the endocardium (such as mitral stenosis);*
   - *Patients with cardiac prostheses (artificial heart valves).*

** **Oral Amoxicillin most commonly used 1 hour before the procedure**

-- **Ampicillin IM or IV 30 minutes before the procedure if the patient cannot take the drug orally**

** **In patients allergic to penicillin:**

- **Orally**1 hour before the procedure: **Clindamycin Or Azithromycin or Clarithromycin**
- **Intravenous** 30 minutes before the procedure:

Clindamycin Or Vancomycin + Gentamicin Or Teicoplanin + Gentamicin

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Penicillin	Cephalosporines	Vancomycin
1-Most useful antibacterial in the practice of dentistry *In dental practice, the penicillin-derivative used most effectively at present is the broad-spectrum agent* ***amoxicillin orally 250-500 mg 3 times /day for 5 days for adult patients.*** *- **High-dose (3 g/8h)** can be effective in controlling **dental abscesses.*** *- When the infection is **severe and the patient is hospitalized,** the drug is given **intravenously at a dose of 0.5-1 g every 8 hours** for adult patients.* ***2-Treatment** of bacterial infections caused by microorganisms sensitive to Penicillins .* ***3-Prophylaxis:*** *-To prevent **recurrence of rheumatic fever:** Benzathine penicillin IM/month.* *-To prevent **subacute bacterial endocarditis** in patients with heart valve disease .*	*In general, there are **few absolute indications** for the use of the cefalosporins in dentistry Although they are much used in other branches of medicine:* ***1-Meningitis:** Third generation.* ***2**-Serious infections of **respiratory tract** caused by klebsiella, enterobacter and haemophilus species.* ***3-Typhoid fever** (ceftrixaone, third generation).* ***4-Gonorrhea** (ceftrixaone) is the drug of choice.* ***5-Urinary tract infection** specially gram – ve.* ***6-Alternative to penicillin** in streptococcal & staphylococcal infection.* ***7-Anaerobic infection** (cefoxitin).*	***1-prophylactically in the prevention of infective endocarditis** before **dental** procedures in patients with prosthetic heart valves **allergic to penicillin (IV)*** *--Vancomycin is **not used routinely** in treatment of dental infection* ***2**-Methicillin resistant staphylococci **(MRSA)*** ***3-Pseudo-membranous colitis** caused by clostridium difficile or staphylococci **(oral).***

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Chemotherapy uses

Tetracyclines

1. management of **periodontal disease.**
2. **intra-oral herpes infection and recurrent aphthous ulceration** to prevent secondary bacterial infection **(Tetracycline rinse)**
   (prepared by stirring the contents of a 250-mg tetracycline capsule into a small amount of water, held in the mouth for 2-3 minutes, three times daily for not more than 3 days at a time. Continuous usage may promote oral thrush. The rinse should not be swallowed).
3. **sinusitis** (Doxycycline).
4. **Respiratory** tract infections (bronchitis).
5. **Urinary** tract infection.
6. **Cholera:** ttt & prophylaxis.
7. **Amoebic** dysentery.
8. **Acne.**

9. **Topically:** Skin and eye infections.

Chloramphenicol

Maxillofacial surgeons use chloramphenicol as a topical application to the **eyes in patients with mid-face trauma** to prevent local infections as the eye lids are swollen and non-functioning.

Systemically:
- **Typhoid** and paratyphoid.

- **Mixed aerobic and anerobic** infections.

Topically: in eye and ear infections.

Amino-glycosides

** The importance of **Gentamycin** in dentistry is that it forms part of the regimen for the **prophylaxis of infective endocarditis** for some patient groups.

Macrolides

1-Erythromycin is a useful **alternative** to **pencillin in dentistry** when the patient is known to be **hypersensitive** to the latter.
* It can be regarded as **a second-choice antimicrobial** to penicillin for the treatment of dental infections.

2-Drug of choice:
- **Mycoplasma**
(atypical Mycoplasma pneumonia).
- **Chlamydia infection**
(Alternative of Tetracyclines).
- **Legionella & Bordetella pertussis**
(gram –ve bacilli).
- **diphtheria**
(gram +ve bacilli).

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R / ...therapy uses

Quinolones	Sulphonamides	Rifampcin	Metronidazole
1. ***Intra-abdominal infections.*** 2. ***Diarrhea*** *caused by toxigenic E. coli* 3. ***typhoid*** *fever.* 4. *For* ***urinary tract infections.*** 5. ***Gonorrheal infection and chlamydial cervicitis and urethritis.*** 6. *infections of* ***bones and joints.*** 7. ***Resistant TB.***	**Systemic uses:** - *Sulfonamides are infrequently used as single agents, as resistant strains are now present.* - *It can be used in respiratory infections (due to pneumococci)* - *meningococcal meningitis (due to meningococci) and urinary tract infection (if no resistance is present).* ***Topical uses:*** *Conjunctivitis →* *Sulphacetamide* *Skin burn and wounds →* *silver sulfadiazine and Mafenide*	***1-TB*** *and* ***leprosy*** ***2-Resistant bacterial infection*** *e.g. staph.* ***3-Drug of choice*** *in chemo-prophylaxis of meningococcal meningitis*	- *Metronidazole is* ***widely used as an antibacterial in dentistry.*** *1. Treatment of* ***acute ulcerative gingivitis*** *2. Treatment of* ***acute pericoronitis*** *3. Treatment of* ***dental abscesses*** *(Obligate anaerobes are sensitive to both penicillin and metronidazole, these organisms produce tissue-active toxins such as collagenase which may be concerned in the extensive inflammatory response which characterizes some acute dental infections).* *4. Metronidazole may be a satisfactory* ***alternative to penicillin*** *in patients with acute dental infections* *-In* ***acute apical infections,*** *400 mg tablets 2-3 times daily.* *-Metronidazole is* ***as effective as penicillin, but may be preferred*** *since it produces* ***fewer hypersensitivity reactions*** *and, in addition, there is* ***a lack of bacterial resistance*** *to metronidazole.* *5.* ***Amebiasis:*** *Amebic Dysentery, Amebic Hepatitis* *6.* ***Giardiasis*** *7.* ***Trichomonas Vaginalis*** *8.* ***Anerobic Bacterial Infections***

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