



ANTIBIOTICS

Antibiotics are naturally occurring, semisynthetic, or synthetic type of antimicrobial agent that destroys or inhibits the growth of selective micro-organisms, generally at low concentration.

HISTORY OF ANTIBIOTICS

1877- Louis Pasteur and Robert Koch – Inhibition of some microbes by others; anthrax (*Bacillus anthracis*) named as 'Antibiosis'.

1942- Waksman renamed it as antibiotic.

1908- Gelmo synthesised it as antibiotic.

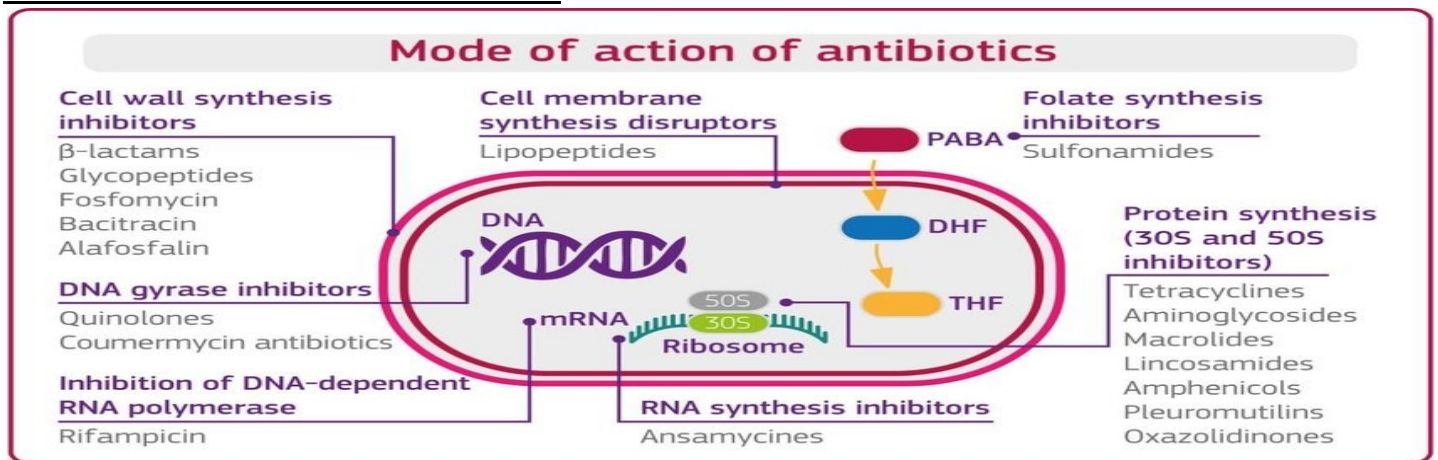
1928- Alexander Fleming, Penicillin notatum inhibits growth of bacteria 'Penicillins'.

1941- Chain n Florey – Discovered properties of penicillin.

USES OF ANTIBIOTICS IN DENTISTRY

1. Treatment of an acute dental infection.
2. Prophylaxis in patients at risk of developing subacute bacterial endocarditis.
3. Prophylaxis in patients with compromised host defence mechanism caused by certain diseases or drug therapy.

MECHANISM OF ACTION OF ANTIBIOTICS



CLASSIFICATION

On the basis of chemical structure

- Sulfonamides
- β-lactam antibiotics
- Aminoglycosides
- Tetracyclines
- Macrolides
- Quinolones

On the basis of type of action

Bacteriostatic

Bactericidal



• Sulfonamides	• Penicillin
• Tetracycline	• Aminoglycosides
• Erythromycin	• Polypeptides
• Clindamycin	• Rifampin
	• Cephalosporin

On the basis of spectrum of activity

Narrow spectrum	Broad spectrum
✓ Penicillin	✓ Tetracycline
✓ Erythromycin	✓ Chloramphenicol
✓ Streptomycin	

COMMONLY USED ANTIBIOTIC DRUGS

ANTIBIOTIC	ROUTE	MECHANISM	DOSAGE AND FREQUENCY	INDICATION
Aminoglycosides Gentamicin	IM/IV	Bactericidal	3mg/Kg/day in equal doses q 8h	Component of bacterial endocarditis prophylaxis for patients at high risk
Cephalosporin's Cefaclor Cefadroil Cephalexin	PO PO	Bactericidal	250-500mg q 8h 500mg to 1g q 12 to 24 h 250-500mg q 6h	Useful when broader spectrum is needed
Penicillins Penicillin G Penicillin V Amoxicillin	IM/IV PO PO	Bactericidal	600,000-1,20,000 units q 12-24h 500mg initially, then 250-500mg q 6h 1g initially , then 250-500mg q 6h	Drug of choice for most infection Drug of choice for most infection Bacterial endocarditis prophylaxis
Macrolides Erythromycin Azithromycin	PO PO	Bacteriostatic	250-500 mg q 6h 10mg/kg up to 500mg initially followed by 5mg/kg up to 250mg qd to complete 5 days	Useful for mild infection and bacterial endocarditis prophylaxis if patient is penicillin allergic
Tetracycline Doxycycline	PO	Bacteriostatic	Initially 100 mg q 24 h or 50 mg q 12h	Mild infections when need broad spectrum , periodontal disease
Clindamycin	IV/PO	Bactericidal and bacteriostatic	150mg q 6h	Instead of metronidazole for penicillin allergic patients with serious infections or endocarditis prophylaxis if cannot use penicillin or erythromycin
Metronidazole	IV/PO	Bactericidal	500mg q 6h	Second line therapy for odontogenic infections, ANUG , HIV periodontitis

AMERICAN HEART ASSOCIATION (AHA) GUIDELINES- MAY 2007 (Prophylaxis for subacute infective endocarditis)



Prophylactic Antibiotic Regimen*

Situation	Agent	Regimen—Single Dose 30–60 minutes before procedure	
		Adult	Children
Oral	Amoxicillin	2 g	50 mg/kg
Unable to take oral medication	Ampicillin or	2 g IM or IV*	50 mg/kg IM or IV
	Cefazolin or	1 g IM or IV	50 mg/kg IM or IV
	Ceftriaxone		
Allergic to Penicillin or Ampicillin— Oral regimen	Cephalexin or	2g	50mg/kg
	Clindamycin or	600mg	20mg/kg
	Azithromycin or	500mg	15mg/kg
	Clarithromycin		
Allergic to Penicillin or Ampicillin and unable to take oral medication	Cefazolin or	1 g IM or IV	50 mg/kg IM or IV
	Ceftriaxone	600 mg IM or IV	20 mg/kg IM or IV
OR Clindamycin			

*Adapted from Prevention of Infective Endocarditis: Guidelines From the American Heart Association, by the Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease. *Circulation*, 2007.

NEWER ANTIBIOTICS IN USE

- Cefepime-4th generation Cephalosporin
- Linezolid
- Tigecycline