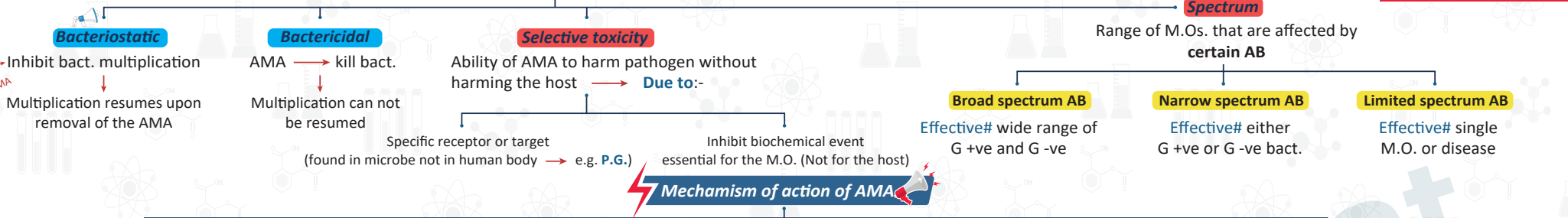


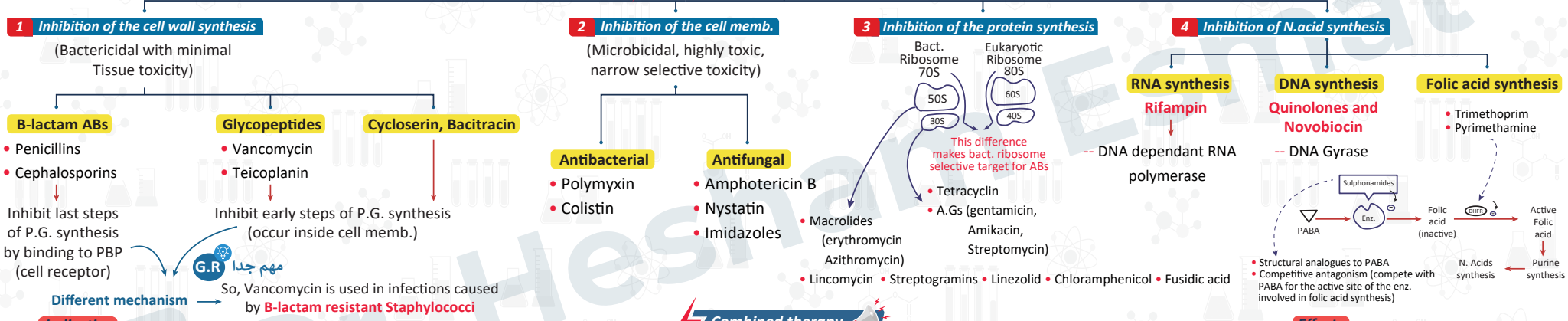
**Chapter 7 : Antimicrobial Chemotherapy**

**Antibiotic**

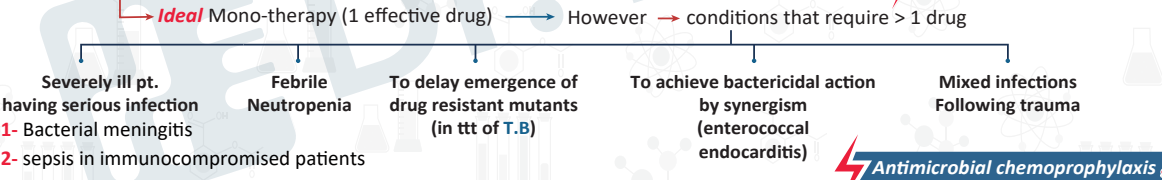
- Low M. wt. AMA produced as 2ry metabolites by certain M.Os
- May be natural, semi-synthetic (chemically modified) or synthetic (Anti-microbial chemotherapeutic agent)



**Mechanism of action of AMA**



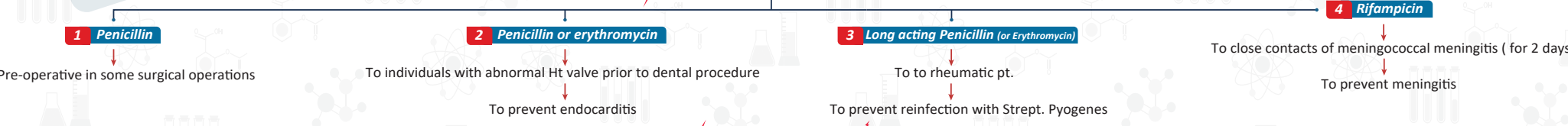
**Combined therapy**



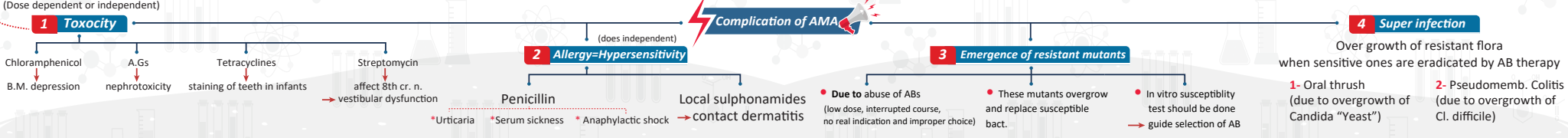
**Effects**



**Antimicrobial chemoprophylaxis**



**Complication of AMA**



# Resistance to AMA

Global problem  
More prevalent in hospitals (esp. in ICU → due to high AB use)

## Intrinsic (inherent or natural) resistance

- Bact. naturally insensitive to AB (without acquisition of resistance factors)
- Consistent → expected once the M.O. is known

e.g. 1- XXXX  
2- XXXX  
3- M.O. lacks target for AB  
(resistance of enterococcus to cephalosporins)

## Acquired resistance

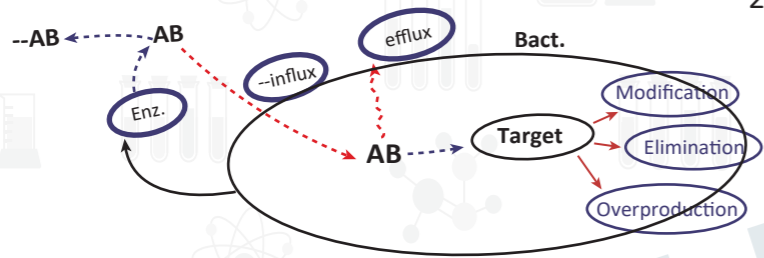
- Due to changes in bact. genome
- Inconsistent and unpredictable → So, lab. methods to detect resistance are necessary
- Acquired by 2 genetic processes in bact.
  - 1- Mutation and selection (vertical evolution) *اسم فقط*
  - 2- Gene transfer (horizontal evolution) *اسم فقط*

# Mechanism

(عناوين فقط مع الامثلة المذكورة هنا)

### 1 Inactivation of AB

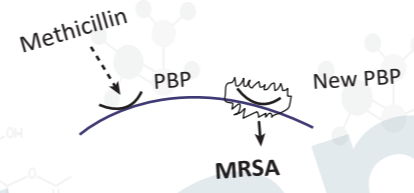
B-lactamase → -- B-lactam Abs  
(Penicillin and Cephalosporines)



### 2 -- I.C. AB conc.

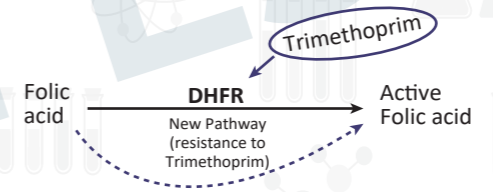
By:  
1) -- AB influx  
2) Efflux pump

### 3 Target modification



### 4 Target elimination

By developing new metabolic pathway



### 5 Target overproduction

VISA

# Choice of AMA for therapy

### 1 Identify nature of inf.

bact., viral, fungal or parasitic

### 2 Select AB

that is able to penetrate site of infection with effective conc.  
(certain drugs can pass BBB)

### 3 Give bactericidal

rather than bacteriostatic drug

### 4 Choose narrow spectrum AB

As broad spectrum ABs cause  
\*Faster resistance  
\*Superinfection

### 5 Give Ab with proper dose for proper duration

-- Dose → AB resistance  
Undue ++ therapy → Drug toxicity

### 6 Know the potential of AB to produce toxicity

(use ABs → safe for pregnant + lactating ♀ and for infants)

# General Micro (10)

# Empiric therapy (Best guess TTT)

## Indications

- Closed inf. (no available sample)
- Seriously ill pt. → Should start ttt without delay (but after collecting sample for culture)

## Provisional diagnosis

depending on **type of infection**  
↓  
List of bact. causing that inf.  
↓  
Other symptoms → Type of bact.  
↓  
AB most likely to successfully treat that infection

## Not always successful

Bact. has unpredictable susceptibilities to AMA