D.PHARM • SECOND YEAR

Pharmacotherapeutics

CHAPTER 2.12

Antimicrobial Resistance

ENGLISH CHAPTER NOTES



DIPLOMA IN PHARMACY

ANTI-MICROBIAL RESISTANCE (AMR)

DEFINITION

AMR occurs when bacteria, viruses, fungi or parasites no longer respond to antimicrobial medicines, making infections harder to treat.
Microorganisms become resistant—not the patient's body.

HOW TREATMENT IS EVADED

- **Enzymatic inactivation:** beta-lactamases break down susceptible beta-lactam antibiotics.
- **Target alteration:** altered penicillin-binding proteins in MRSA reduce drug binding.
- **Efflux pumps:** remove drug from the microbial cell.
- **Reduced permeability:** porin changes limit drug entry.
- **Biofilms:** protected microbial communities can tolerate treatment. Biofilm tolerance is not the same as inherited resistance.

DRIVERS

- Overuse and misuse, including antibiotics for viral illnesses.
- Inappropriate prescribing and non-prescription antibiotic sales.
- Incorrect dose or duration, missed doses and poor adherence.
- Unnecessary antimicrobial use in agriculture and animal husbandry.
- Poor infection prevention and control.
- Limited new drug development reduces treatment options.

DURATION MATTERS

Follow the prescribed dose and duration; do not stop early or extend treatment on your own.
Unnecessarily prolonged courses also increase harm and selection pressure.

ANTI-MICROBIAL RESISTANCE (AMR)

HEALTH IMPACT

- More illness and deaths; longer hospital stays and higher costs.
- Fewer effective options for surgery, cancer care and immunocompromised patients.

Examples of resistant infections:

MRSA: methicillin-resistant *Staphylococcus aureus*.

VRE: vancomycin-resistant enterococci.

CRE: carbapenem-resistant Enterobacterales.

XDR-TB: extensively drug-resistant tuberculosis.

PREVENTION AND STEWARDSHIP

Antimicrobial stewardship means improving antimicrobial use to achieve effective treatment while limiting harm and resistance.

- Hospital stewardship teams; review prescriptions and treatment response.
- Public awareness: no sharing or self-medication.
- Hand hygiene, sterilization and infection-control measures.
- Vaccination; safe water, sanitation and hygiene (WASH).
- Surveillance of resistance and antimicrobial use.

MEDICINES, POLICY AND RESEARCH

- Choose treatment using clinical assessment and susceptibility results when available.
- Reserve last-resort agents, such as colistin, for appropriate specialist use.
- Use combination therapy only where evidence and guidelines support it.
- WHO Global Action Plan supports coordinated action across human, animal and environmental health.
- Develop new antibiotics and resistance-breaking agents.
- Bacteriophage therapy, immunotherapy and host-directed therapies are research or specialist approaches—not routine replacements for all antibiotics.

If you like our notes

pls share our app with your friend

It help us to get motivate and
create such wonderful notes in future as well.



Follow us on

Instagram | YouTube

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.