# Infectious diseases

## Rational Use of Antibiotics

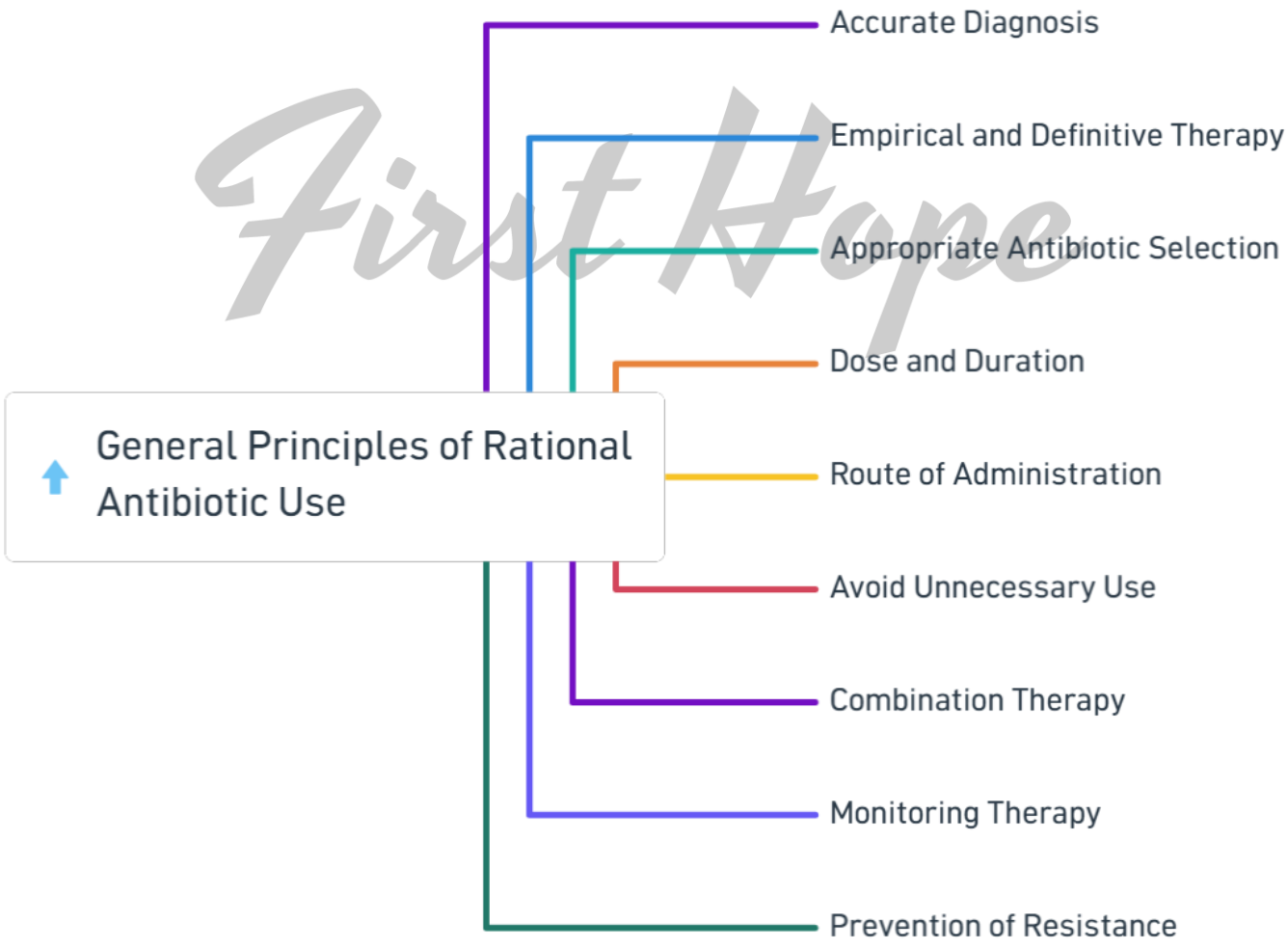
### Definition

- Rational use of antibiotics means using the **right drug, at the right dose, for the right duration**, and only when necessary.

### Objectives

- Achieve maximum therapeutic effect
- Minimize toxicity and side effects
- Prevent development of antimicrobial resistance
- Reduce treatment cost

### General Principles




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#### 1. Accurate Diagnosis

- Confirm infection (bacterial vs viral vs fungal)
- Antibiotics are not effective against viral infections
- **Use laboratory tests:**

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- Culture and sensitivity
- Gram staining

## 2. Empirical Therapy vs Definitive Therapy

- **Empirical therapy**:
  - Started before culture results
  - Based on most likely organisms
- **Definitive therapy**:
  - Based on culture and sensitivity reports
  - More targeted and specific

## 3. Selection of Appropriate Antibiotic

- **Based on:**
  - Site of infection
  - Likely pathogen
  - Patient factors (age, renal function, allergy)
- Prefer **narrow-spectrum antibiotics** when possible

## 4. Dose and Duration

- Adequate dose to maintain therapeutic levels
- Duration should be sufficient to eradicate infection
- **Avoid:**
  - Underdosing → resistance
  - Overuse → toxicity

## 5. Route of Administration

- Oral: mild to moderate infections
- Intravenous: severe infections, hospitalized patients
- Switch IV → oral when patient improves

## 6. Avoid Unnecessary Use

- **Do not use antibiotics for:**
  - Common cold
  - Viral fever
- Avoid self-medication

## 7. Combination Therapy

- **Indications:**

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- Severe infections
- Mixed infections
- Prevent resistance (e.g., tuberculosis)

➢ Avoid unnecessary combinations

### 8. Monitoring Therapy

➢ Clinical improvement

➢ Lab parameters

➢ Adverse drug reactions

### 9. Prevention of Resistance

➢ Complete full course of therapy

➢ Avoid misuse and overuse

➢ Hospital antibiotic policy adherence

## Surgical Prophylaxis

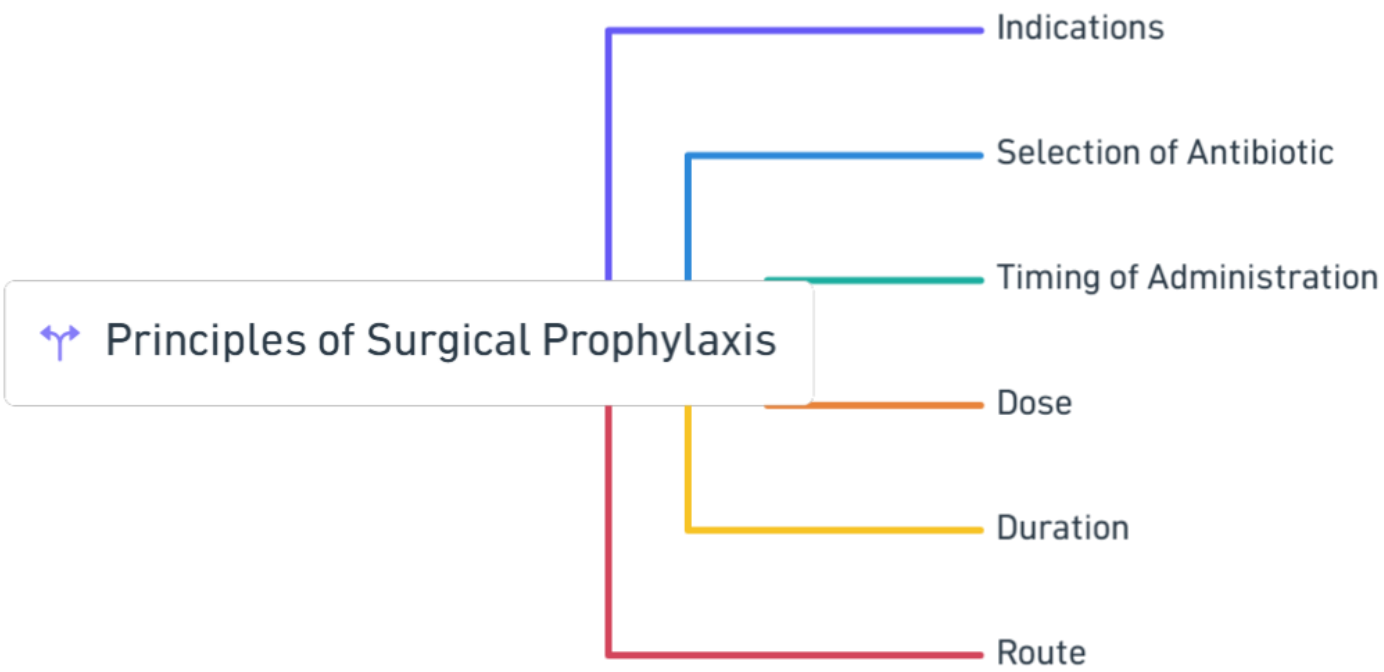
### Definition

- Use of antibiotics before, during, or after surgery to prevent surgical site infections (SSI)

### Goals

- Reduce risk of postoperative infections
- Achieve adequate drug concentration at surgical site

### Principles of Surgical Prophylaxis




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1. **Indications**
   - Clean-contaminated surgeries (e.g., GI surgery)
   - Contaminated surgeries
   - Prosthetic implant surgeries (e.g., joint replacement)
   - Not always required in clean surgeries
2. **Selection of Antibiotic**
   - **Based on:** Expected organisms at surgical site
   - **Common drugs:**
     - Cefazolin (most commonly used)
     - Metronidazole (for anaerobic coverage)
3. **Timing of Administration**
   - Given 30–60 minutes before incision
   - Ensures adequate tissue concentration during surgery
4. **Dose**
   - Standard dose; may need adjustment in obesity
   - Repeat dose if surgery is prolonged (>3–4 hours)
5. **Duration**
   - Usually, single dose or <24 hours
   - Prolonged use is not recommended
6. **Route**
   - Intravenous route preferred

## Monitoring

- Signs of infection (redness, swelling, fever)
- Adverse reactions

## Important Clinical Points

- Prophylaxis is preventive, not therapeutic
- Overuse leads to resistance and increased cost

# Urinary Tract Infections (UTI) – Pharmacotherapeutics

## Definition and Overview

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- **UTI** is an infection affecting any part of **urinary system:**
    - Urethra (urethritis)
    - Bladder (cystitis)
    - Kidney (pyelonephritis)

## Common Causative Organisms

- Escherichia coli (most common)
- Klebsiella
- Proteus
- Enterococcus

## Risk Factors

- Female gender
- Poor hygiene
- Catheterization
- Diabetes
- Urinary obstruction

## Clinical Features

### 1. Lower UTI (Cystitis)

- Burning urination (dysuria)
- Frequent urination
- Urgency
- Lower abdominal pain

### 2. Upper UTI (Pyelonephritis)

- Fever
- Flank pain
- Nausea, vomiting
- Severe illness

## Goals of Pharmacotherapy

- Eradicate infection
- Relieve symptoms
- Prevent complications and recurrence

## Drug Therapy

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