

Need to rationalize use of Antibiotics

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RATIONAL USE OF MEDICINES

"RATIONAL USE OF DRUGS REQUIRES THAT PATIENTS RECEIVE MEDICATION APPROPRIATE TO THEIR CLINICAL NEEDS, IN DOSES THAT MEET THEIR OWN REQUIREMENTS FOR AN ADEQUATE PERIOD OF TIME AND THE LOWEST COST TO THEM AND THEIR COMMUNITY."

KEY OF RATIONAL DRUG PRESCRIBING

IS TO USE -

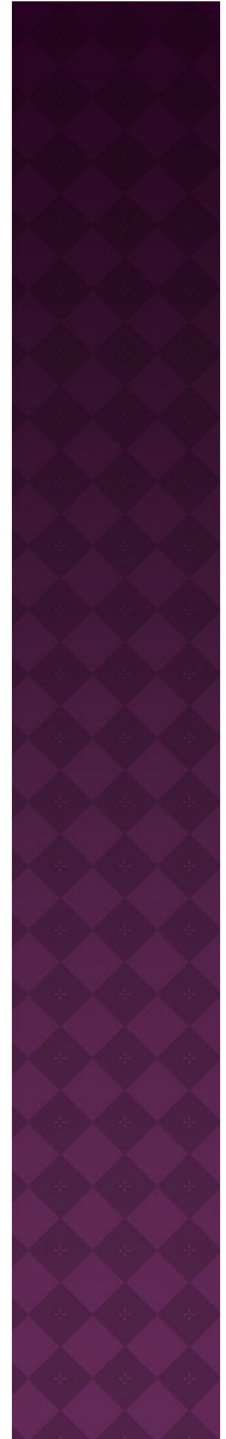
- * RIGHT DRUG**
- * IN RIGHT PATIENT**
- * IN RIGHT DOSE**
- * BY RIGHT ROUTE**
- * AT RIGHT TIME**
- * WITH RIGHT DOCUMENTATION**

CRITERIA FOR RATIONAL DRUG PRESCRIBING

- ❖ **APPROPRIATENESS**
- ❖ **EFFICACY**
- ❖ **SAFETY**
- ❖ **COST OF THERAPY**

WHO POLICY PERSPECTIVE IN MEDICINES (2002)

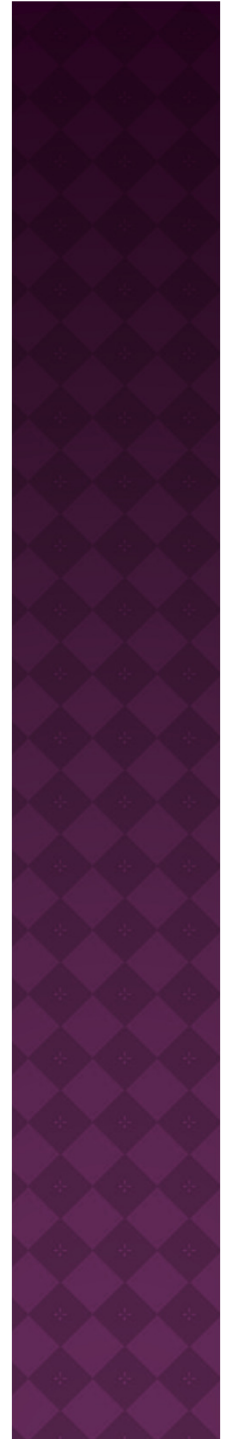
***WORLDWIDE MORE THAN 50 PERCENT
OF ALL MEDICINES ARE PRESCRIBED,
DISPENSED, OR SOLD INAPPROPRIATELY,
WHILE 50 PERCENT OF THE PATIENTS
FAIL TO TAKE THEM CORRECTLY.***



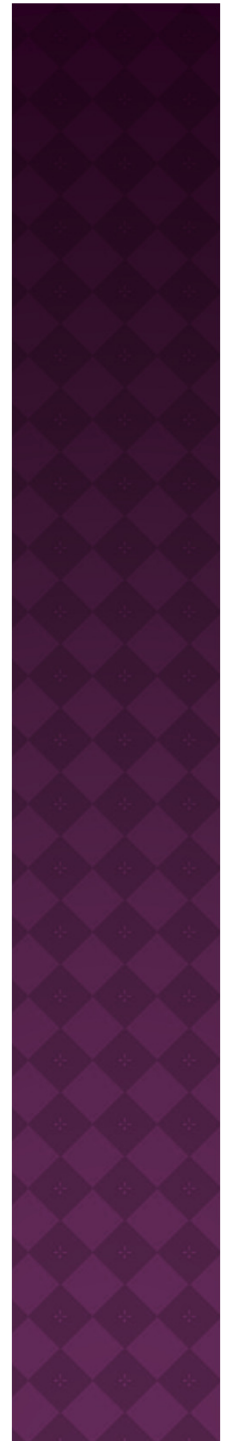
ANTIBIOTICS - PRECIOUS DRUGS

- ***SIGNIFICANT BURDEN OF INFECTIOUS DISEASES IN INDIA.***
- ***LIMITED RESOURCE OF ANTIBIOTICS.***
- ***ONLY FEW DRUGS ARE IN PIPELINE.***
- ***TEIXOBACTIN IS THE ONLY ANTIBIOTIC DEVELOPED IN LAST 3 DECADES.***

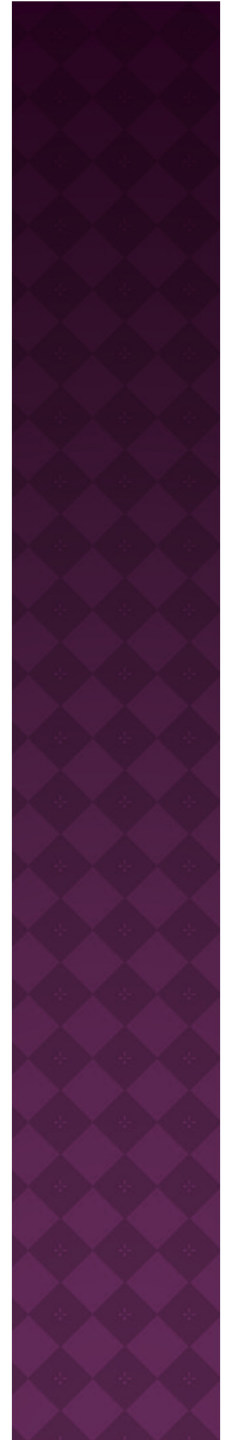
Antibiotics are one of the most commonly prescribed drugs being responsible for 30-50 % of hospital's total drug budget.



- ◉ **In 2010 - 13 billion pills of Antibiotic were consumed in India as against 10 billion in China and 7 billion in USA annually.**
- ◉ **In India Antibiotic use is increased by 43% from 2000 to 2010.**



***NEED OF HOUR IS TO
RATIONALIZE USE OF
ANTIBIOTIC IN THE
INTEREST OF SCIENCE AND
SOCIETY***



SELECTION OF ANTIBIOTICS

On the basis of -

1. **Clinical judgment.**
2. **Microbiological information.**
3. **Pharmacological knowledge.**

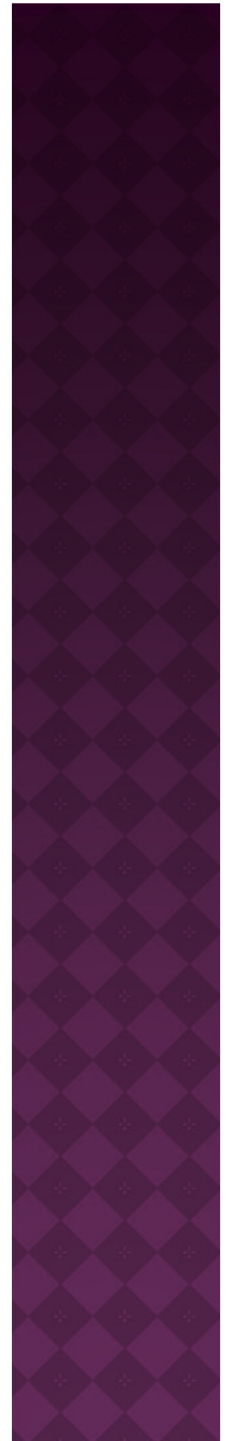
OVERUSE & MISUSE OF ANTIBIOTICS

Use of Antibiotics in every case of fever.

Use of Antibacterial drug for the treatment of untreatable infections.

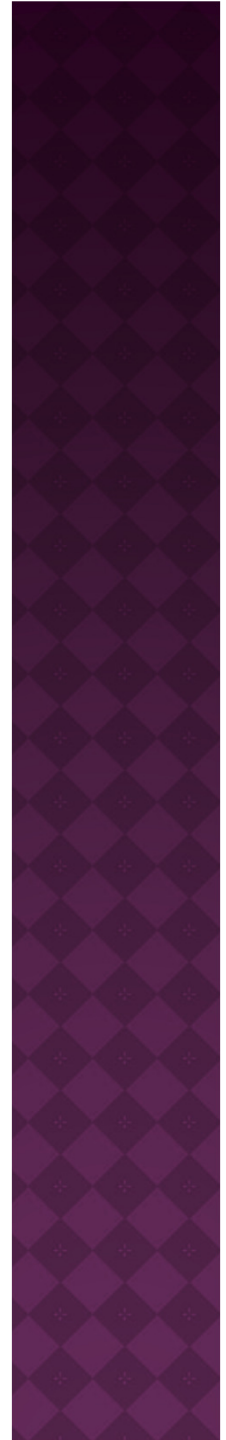
OVERUSE & MISUSE OF ANTIBIOTICS

Use of Antibiotics where
actually surgical
intervention is required.



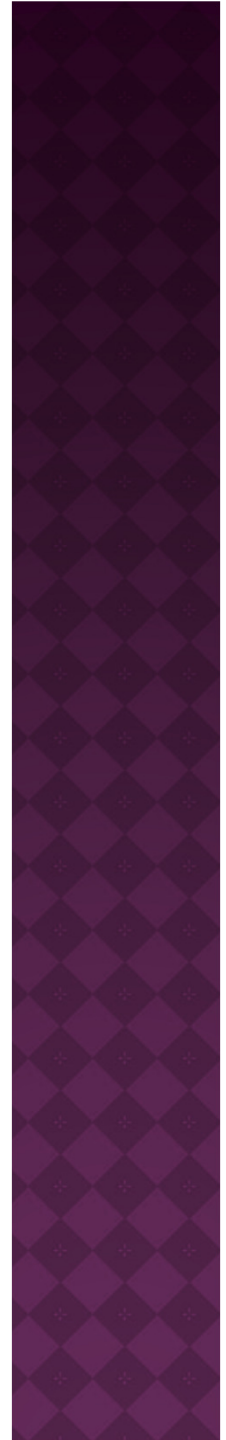
OVERUSE & MISUSE OF ANTIBIOTICS

Unnecessary use of
systemic Antibacterials.



OVERUSE & MISUSE OF ANTIBIOTICS

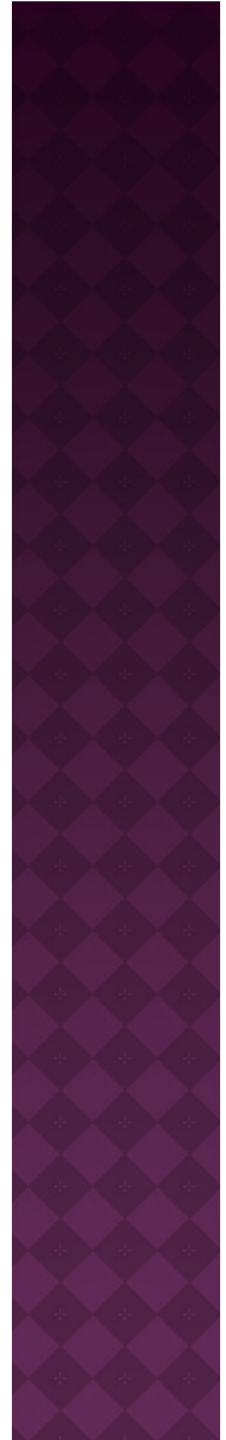
Overreliance on
parenteral antibiotics.



OVERUSE & MISUSE OF ANTIBIOTICS

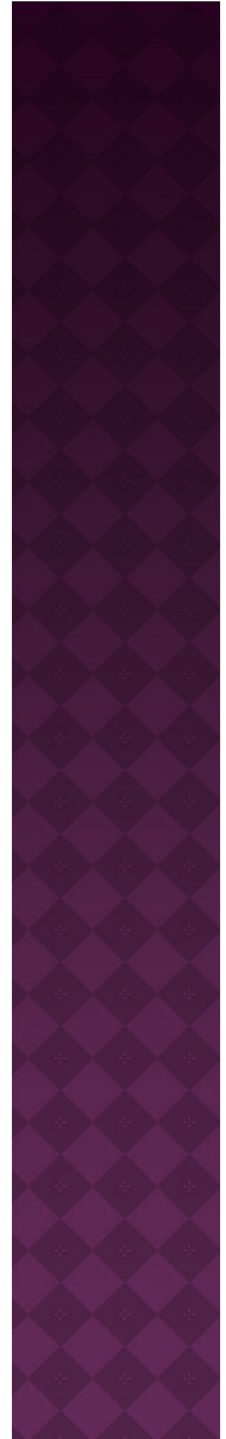
Inappropriate doses.

Inadequate duration of therapy.



ANTIBIOTIC PRESCRIBING INFLUENCED BY -

- **Patient.**
- **Pharmaceutical industry.**



OVERUSE & MISUSE OF ANTIBIOTICS

DUE TO DIAGNOSTIC UNCERTAINTY

BECAUSE OF -

- I. **INADEQUATE KNOWLEDGE OF
PRESCRIBER**
- II. **LACK OF MICROBIOLOGY FACILITY**
- III. **UNAFFORDABILITY OF DIAGNOSTIC
TESTS.**

ANTIBIOTIC PROPHYLAXIS IS UNJUSTIFIED -

1. After clean elective surgery.
2. In neonates born after prolonged or instrumental delivery.
3. To prevent post partum infection after normal delivery.
4. To prevent secondary bacterial infection after viral infection.
5. To prevent respiratory infection in unconscious patient or those who are on ventilators.

ANTIBIOTIC PROPHYLAXIS OF **SURGICAL SITE INFECTIONS** **(SSIs)**

Antibiotics used for prophylaxis are often inappropriately chosen and administered. 30% of antibiotics used in hospital are for prophylaxis and more than 80% are given inappropriately for >48h duration.

RISK FACTORS FOR POST- OPERATIVE WOUND INFECTIONS **(SENIC RISK FACTORS)**

- ◎ **Operations on abdomen.**
- ◎ **Operation lasting for more than 2 hrs.**
- ◎ **Contaminated or dirty wound classification.**
- ◎ **At least 3 medical diagnosis.**

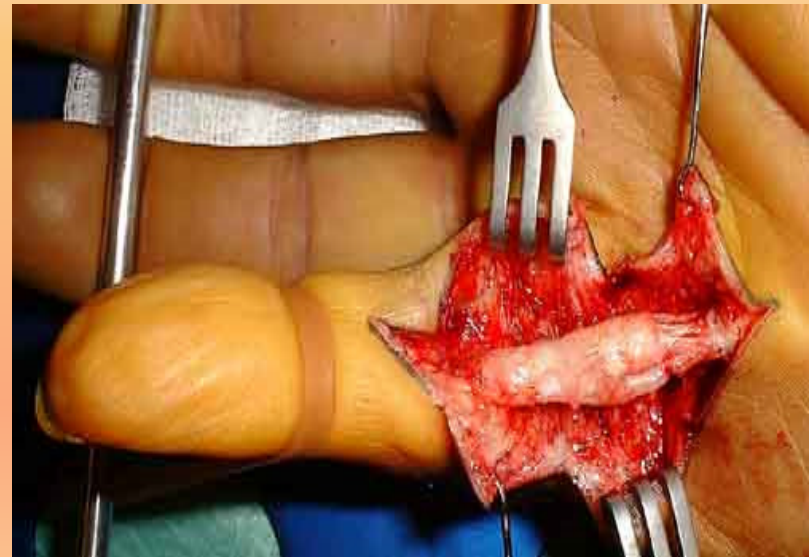
ANTIMICROBIAL PROPHYLAXIS

NEEDED IN -

- ◉ **Clean contaminated wound**
- ◉ **Contaminated wound**
- ◉ **Dirty wound**
- ◉ **Surgeries involving insertion of prosthetic material.**
- ◉ **Heart surgery**
- ◉ **Neurosurgery**
- ◉ **Immunocompromised patient**
- ◉ **Other risk factors**

I - Clean

- **Elective**
- **Primarily closed procedure.**
- **Respiratory, GIT, biliary, genitourinary or oropharyngeal tract not entered.**
- **No acute inflammation.**
- **No break in aseptic O.T. technique.**
- **Expected infection rate $\leq 2\%$.**



II – Clean Contaminated

- **Urgent or emergency case that is otherwise clean.**
- **Controlled opening of respiratory, GIT, biliary or oropharyngeal tract.**
- **Minimum spillage or minor break in technique.**
- **Expected infection rate $\leq 10\%$.**



III – Contaminated

- **Acute non-purulent inflammation.**
- **Major technique break or major spill from hollow organs.**
- **Penetrating trauma less than 4 hrs old.**
- **Chronic open wound to be grafted or covered.**
- **Expected infection rate about 20 %.**



IV – Dirty

- **Purulent or abscess.**
- **Pre-operative perforation of respiratory, GIT, biliary or oropharyngeal tract.**
- **Penetrating trauma more than 4 hrs old.**
- **Expected infection rate about 40 %.**



CHOICE OF ANTIBIOTIC

- ⦿ **Most effective**
- ⦿ **Peak conc. > MIC**
- ⦿ **Least toxic**
- ⦿ **Least expensive**
- ⦿ **Not affecting normal flora of host**

TIME & ROUTE OF ADMINISTRATION

- ◎ **Within 1 hr prior to incision**
- ◎ **Intravenously**

MOST PREFERRED PROPHYLACTIC
ANTIBIOTIC

Cefazolin – 1 gm Intravenously
(30 mg / kg .Bw)

AMPICILLIN – SULBACTAM

3 gm I/v (50 mg/Kg.Bw)

Alternative to Cefazolin In –

- ⦿ **Lung surgery**
- ⦿ **Head neck cancer surgery**
- ⦿ **Plastic surgery**
- ⦿ **Biliary tract surgery**

PROPHYLACTIC ANTIBACTERIALS:
IN CASE OF ALLERGY TO CEPHALOSPORINS

Clindamycin – 600 mg I.V.

+

Gentamicin – 1.5 mg / Kg Bw I.V.

FOR UROLOGIC SURGERY:

Ciprofloxacin – 400 mg I.V.

(10 mg / kg Bw)

PROPHYLACTIC ANTIBIOTIC:
WHEN ANAEROBIC INFECTION IS
ANTICIPATED

Cefotetan – 2 gm I.V. (40 mg / kg Bw)

Or

Cefoxitin – 2 gm I.V. (40 mg / kg Bw)

Or

Cefazolin – 1 gm I.V. + Metronidazole – 500 mg I.V.
(15 mg /kg Bw)

Or

Clindamycin – 600 mg I.V. (10 mg /kg Bw)
(In case of allergy to cephalosporin)

PROPHYLACTIC ANTIBIOTIC:
WHEN INFECTION WITH MRSA IS
ANTICIPATED

Vancomycin – 1 gm I.V.

Or

Teicoplanin – 200 mg I.V.

DURATION OF PROPHYLAXIS

Mostly single dose

**Give additional dose of antibiotics
in the event of intraoperative
blood loss**

**(1.5 L for adult or 25 ml/Kg Bw for
children)**

DURATION OF PROPHYLAXIS

If antibiotic is to be continued post operatively, the duration should be less than 24 hrs regardless of the presence of intravascular catheters or indwelling drains.

DURATION OF PROPHYLAXIS

- 24 hrs –** **Vascular Surgery**
Head & Neck Surgery
Grade I/II open fractures
Liver Transplant
Penetrating Abdominal Trauma
- 48 hrs –** **Cardiothoracic Surgery**
Grade III open fractures
Kidney Transplant
- 5 Days -** **Penetrating Trauma requiring Neurosurgery**
Lung Transplant

REDOSING FREQUENCY INTRA-OPERATIVELY

(If surgery is prolonged beyond 4 hrs)

Drug	Recommended Re-dosing Interval
Cephalosporins, Clindamycin, Ampicillin + Sulbactam	4 h
Ciprofloxacin	6 h
Metronidazole, Aminoglycosides	8 h
Vancomycin	12 h

Delay in time to Surgical Incision

>60 min	Repeat pre-op-dose of antibiotic (except of Ciprofloxacin & Vancomycin)
>120 min	Repeat pre-op-dose of Ciprofloxacin
>8 hrs	Repeat pre-op-dose of Vancomycin

ANTIBIOTIC PRESCRIBING WITH MISCONCEPTS -

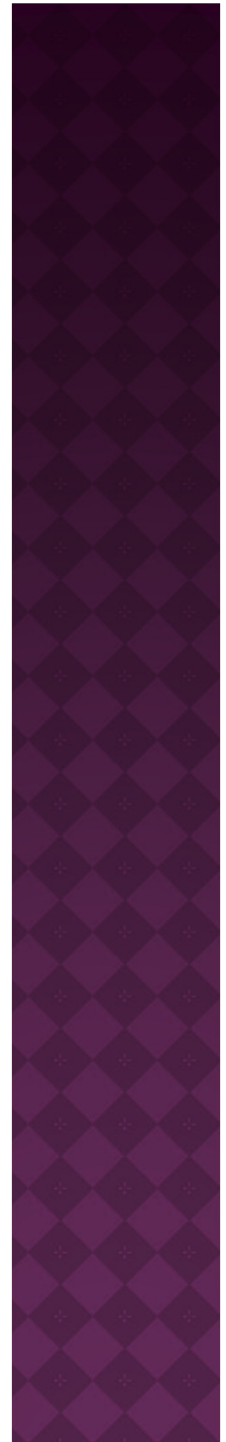
- ❖ Newer drugs are always better drugs.
- ❖ Costly drugs are always better drugs.
- ❖ Polypharmacy is always better.
- ❖ FDCs are always better.

NEED TO RATIONALIZE USE OF ANTIBIOTICS

- ◎ **Bad Bugs, No Drugs.**
- ◎ **IDSA launched “10 X 20 initiative” .**

ANTIBIOTICS – PRECIOUS DRUGS

**Antibiotics have saved our
lives for so long and now
it is the time for us to save
antibiotics.**



“Medicines are nothing in themselves, but are the very hands of gods if employed with reason and prudence.”

-Herophilus

*Every prescription is the
beginning of a new experiment
Begin it carefully, remain
vigilant make the patient
healthy get blessed from the
almighty*



hank ou