

Definition:

• TDM refers to the monitoring of concentrations of drug in plasma for optimal drug therapy.

• Primary objective is to obtain rapid and safe concentrations of drug in plasma within desired therapeutic range in order to provide safe and efficacious treatment.

• To administer a drug optimally to the patient, knowledge of rate processes of ADME that is pharmacokinetic parameter is necessary

• In administering potent drugs to patients, the physician must maintain the plasma drug level within a narrow range of therapeutic concentration.

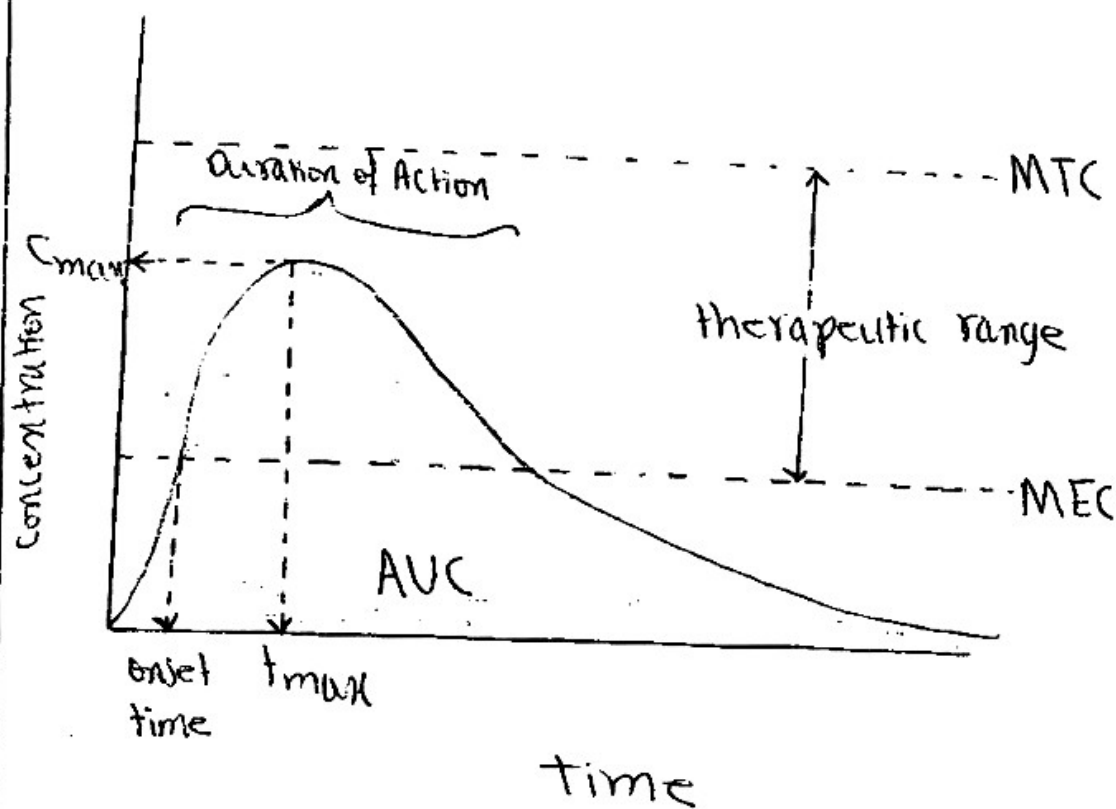
• The too high concentration of drug in plasma (above MSD) leads to toxic effect and too

less concentration of drug (below MEC) results in ineffective therapy.

Plasma level time curves:

• This curve is generated by obtaining drug concentration in plasma. Samples taken at various time intervals after a drug product is administered.

• The concentration of drug in each plasma samples is plotted on a rectangular coordinate graph paper against corresponding time.



• MEC (minimum effective concentration). It is the minimum concentration of drug in the plasma that produce a pharmacological effect.

• MSC (maximum safe concentration). Also called as MTC, minimum toxic concentration, is the concentration of drug in plasma above which adverse effects are precipitated.

• Onset time: time required for a drug to reach MEC.

• Duration of Action: Time period for which the plasma concentration of drug remain above MEC.

Therapeutic range for commonly monitored drugs:

Carbamazepine 4-12 mcg/ml

Gentamicin: 5-10 mcg/mL

Digoxin: 0.8-2 ng/ml

Functions of TDM:

DD-TIA-PK-MK

1. Drug selection
2. Design dosage regimen
3. Evaluate patient response
4. Determine need for measuring serum drug concentration
5. Assay for drug concentration in biological fluids
6. Perform pharmacokinetic evaluation
7. Re-adjust dosage regimen if necessary
8. Monitor serum drug conc.
9. Recommend special requirements

Significance of TDM:

- To identify intensity of pharmacological or toxic effect of drug related to concentration of drug at receptor site.
- It ascertains that the calculated dose

actually delivers the plasma level required for the therapeutic effect.

- Monitoring of drug dosage regimen
- Identifies the patient non-compliance
- Identifies effects of drug interaction.

Clinical significance of TDM:

1. Maximizes efficacy
 2. Avoid toxicity
 3. identifies therapeutic failure
 4. identify poisoning, drug toxicity and drug abuse
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- What is AUC with regard to an antibiotic? [2m, 10]