# Therapeutic drug monitoring

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## INTRODUCTION

Therapeutic Drug Monitoring (TDM) is the Measurement of drug and body fluids such as plasma in blood. It is also a branch of clinical chemistry and clinical pharmacology. Therapeutic drug monitoring helps you to define the dosage of a drug which is taken by a patient. It helps in measuring the dosage in order to provide safety and effectiveness to the drug. TDM of plasma can be used for treatment and diagnostic purposes.

Drugs are dosed to provide sufficient and safe use. But some drugs are difficult to dose and such type of drugs are monitored by using therapeutic drug monitoring. The type of drugs which are needed to be monitored include antibiotics such as tobramycin and gentamycin, drugs which are used to treat autoimmune diseases such as cyclosporine, cardio drugs such as digoxin and lidocaine, antiseizure drugs such as phenytoin and drugs that are used to treat bipolar disorder such as lithium and valporic acid.

## SIGNIFICANCE OF TDM

Therapeutic drug monitoring is used to test the medicine before consumption. Once the dose is determined, the patient is tested regularly for effective action of the drug. A drug will undergo TDM only when it fulfills the criteria such as narrow target range, cost effective range, pharmacokinetic variability levels, compatibility with the plasma concentration and clinical effects [1].

Therapeutic drug monitoring is required only for such drugs which are taken for lifetime. As the patient's health condition and therapeutic level changes with the time, the dosage might vary to acquire desired results. Over the time period the patient may obtain other chronic condition which are need to be monitored thoroughly. And these changes occur due to illness, infections, physical stress and surgery [2].

## MONITORING THE DRUG

The main aim of TDM is to reduce the toxicity of the drug and make it more effective. The drug which is given to a person reaches to the targeted site by undergoing metabolism and absorption. The complete drug form does not reach the target site. So, TDM helps in monitoring the drug along with the blood level of the person. The dose is increased or decreased according to the action levels of the drug. The dosage levels are monitored frequently to avoid the increase or decrease in the effectiveness of the drug [3].

When the effect of the drug alters, the health professional monitors the dosage of the drug and will adjust it to the required level. The dosage of the drug depends on some of the factors such as body weight, age, nutritional status and other health conditions such as acute or chronic conditions of kidney, liver and heart, burns, trauma and shock. By considering every health condition, the dose will be changed accordingly. Depending on the type of medicine taken, test must be scheduled. There is a risk in having a blood test. You may experience pain or bruising at the spot where the needle was pierced in, but most symptoms fade away instantly [4].

## TESTING OF DRUG

For testing the drug, samples are collected. The timing of the collection of sample is important because the drug concentration changes during the dosing interval. The least variable point in the dosing interval would be before the next dose [5SD]. This pre dose or trough concentration is usually measured. Samples for the drugs with long half-lives like phenobarbitone and amiodarone can be collected at any point of time in the dosage interval. The ample time is taken into consideration to test the absorption, distribution and mechanism of the drug.

## REFERENCES

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