

## Brief Note on Therapeutic Drug Monitoring

Maha Reinprayoon\*

Department of Respiratory and Critical Care Medicine, Hawassa University, Riyadh, Saudi Arabia

### DESCRIPTION

Therapeutic Drug Monitoring (TDM) is a test that measures the amount of certain drugs in the blood. It is done to make sure that the amount of medicine you are taking is safe and effective. Most drugs can be dosed correctly without special tests. However, with certain types of medications, it can be difficult to determine a dose that provides enough medication to treat your condition without causing dangerous side effects. TDM will help your doctor determine if you are taking the correct dose of your medicine.

Therapeutic drug monitoring is the clinical practice of measuring certain drugs at set intervals to maintain a constant concentration in a patient's bloodstream and thus optimize individual dosing regimens. Most drugs do not require the use of TDM and are used primarily to control drugs with narrow therapeutic ranges, drugs with pronounced pharmacokinetic variability, drugs whose target concentrations are difficult to control, and drugs that are known to be therapeutic and have undesirable effects. The MDD process is based on the assumption that there is a definable relationship between the dose and the plasma or blood concentration of the drug, as well as between the concentration and the therapeutic effect. MDD begins when the drug is first prescribed and involves determining an initial dosage regimen that is appropriate for the clinical condition and patient characteristics, such as age, weight, organ function, and concomitant drug therapy. When interpreting concentration measurements, among other things, the sampling time should be considered in relation to drug dose, dose history, patient response, and desired medical goals. The goal of TDM is to use appropriate concentrations of difficult-to-use drugs to optimize clinical outcomes in patients in various clinical settings.

You may need a test the first time you start taking any medicine. This will help your doctor determine the most effective dose for you. Once that dose is determined, you can be tested regularly to make sure the medicine continues to work without being harmful. You may also need to be tested if you have symptoms of

a serious side effect. Side effects vary by drug. Your doctor will tell you what symptoms to look out for. A doctor will use a small needle to take a blood sample from a vein in your arm. After the needle is inserted, a small amount of blood is collected in a test tube or vial. You may feel a slight sting when the needle goes in or out. This usually takes less than five minutes.

Therapeutic drug monitoring is the measurement of certain drugs and or their breakdown products (metabolites) at fixed intervals to maintain a relatively constant concentration of the drug in the blood. Some of the drugs that are monitored tend to have a narrow "therapeutic index," which is a relationship between the toxic and therapeutic (effective) drug dose.

Once a drug enters the body, various processes begin to remove the drug from the body. The time it takes for the body to reduce the drug concentration from its initial value by half is called the drug half-life. Generally, it takes about five half-lives to completely remove a drug from the body. In general, a person should receive a dose of the drug at regular intervals to ensure that the effective or therapeutic concentration of the drug is maintained in the body. With some drugs, maintaining this stable state is not as easy as giving a standard dose of the drug. Each person will absorb, metabolize, use, and eliminate drugs at different rates based on their age, general health, and genetic makeup. The concentration of drugs in the body may increase or decrease due to the interference of other drugs that you may be taking with the drug. This is also known as a drug interaction.

Not all drugs require therapeutic follow-up. Most drugs have a wide therapeutic range and can be prescribed based on pre-established dosage schedules. The efficacy of these treatments has been evaluated, but blood levels of the drug are not required for dosing. Examples of medications that do not require monitoring include medications for high blood pressure (hypertension) and many of the antibiotics used to treat bacterial infections. If an infection with a specific antibiotic has resolved or blood pressure is lowered with prescription blood pressure medication.

**Correspondence to:** Maha Reinprayoon, Department of Respiratory and Critical Care Medicine, Hawassa University, Riyadh, Saudi Arabia, E-mail: Maha@prayoon.sa

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