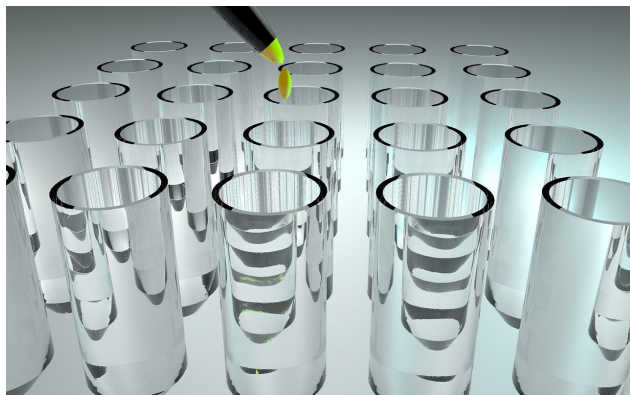


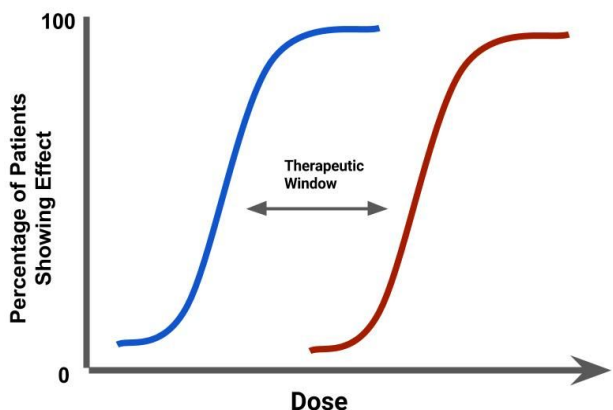


June 2017



## ***The Importance of Therapeutic Drug Monitoring in the Clinic***

Therapeutic drug monitoring (TDM) is defined as the measurement of a chemical by a clinical laboratory that is used to influence the dosing or drug prescribing procedures of a therapy<sup>1</sup>. Important parameters like metabolism can vary from individual-to-individual, which means that TDM often requires a coordinated multidisciplinary team partnered with a capable clinical laboratory to effectively monitor drug concentrations or metabolites within a narrow therapeutic window.



TDM allows clinicians to optimize patient benefit by maintaining drug dosage in the appropriate therapeutic range (or window) for a variety of indications. These include monitoring compliance, avoiding toxicity, detecting drug interactions, and guiding the withdrawal from drugs of abuse<sup>1</sup>. The latter example may be particularly illustrative to highlight the necessity of TDM because the suppression of withdrawal is key to rehabilitation.

A literature review by Brunen et al. (2011) on the use of TDM for the treatment of substance-related disorders supports this. The researchers found that TDM should be established for drugs such as bupropion, buprenorphine, disulfiram (or a metabolite), methadone, and naltrexone<sup>2</sup>. For instance methadone, commonly used for opioid addiction, has a metabolism that is highly variable between individuals. This can pose serious problems for recovery in those patients who are rapid metabolizers or poor responders, resulting in the patient persisting in the use of street drugs while in therapy<sup>3</sup>. The use of TDM can help identify these people early and help the doctors find a more effective alternative treatment<sup>3</sup>. Effective recovery from opioid addiction therefore, requires a holistic partnership between a patients and their caregivers, one in which TDM is essential.

It is apparent then that therapeutic drug monitoring plays an important role in the development of safe, effective, and individualized medical treatment. When implemented properly, TDM must go beyond the straightforward comparison of a patient's blood drug concentration to a target range;

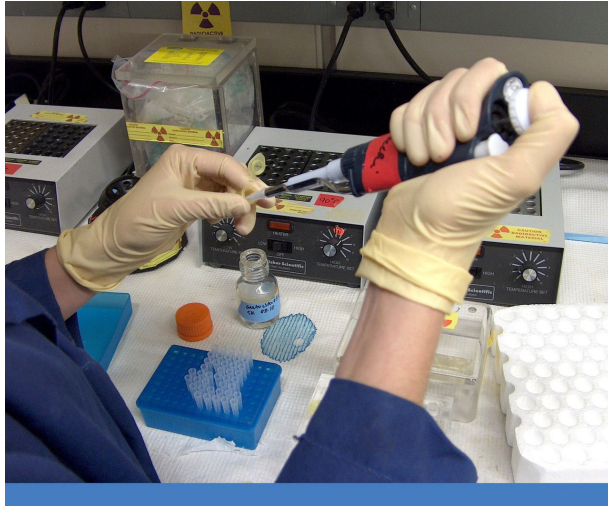
<sup>1</sup> [Korean J Intern Med. 2009 Mar; 24\(1\): 1-10.](#)

<sup>2</sup> [Ther Drug Monit. 2011 Oct;33\(5\):561-72.](#)

<sup>3</sup> [Br J Clin Pharmacol. 2014 Feb; 77\(2\): 253-263](#)

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rather the clinicians and the laboratory must also consider many other factors such as the dosage history, patient's response, and clinical targets to best optimize therapy<sup>1</sup>.



## ***The Cut-Off Level: A Difference Between Positive and Negative***

Assays for drug screening measure the amount of drug in a sample, but some value must be established that represents the difference between a positive result and a negative one. This value, called a "cut-off level", is set such that the number of false positives is minimized while still optimizing the detection of the drug. This cut-off level is often also the value that the medical community considers clinically relevant and varies depending on the drug test. Just as a negative result does not necessarily mean that

the sample is completely drug-free (i.e. it may be present below the limit), a positive result indicates the presence of a drug (or metabolite) in sufficient quantities above the cut-off. By re-testing results near the cut-off, the confidence in the interpretation of the results is increased. Here's how repeat testing could be interpreted for a patient being monitored for a prescribed medication could be interpreted:

- Consistent positive - This is the expected result, i.e. the patient was prescribed a medication and the drug/metabolite was detected, indicating compliance.
- Inconsistent positive - This is an unexpected result. Requires further investigation.
- Consistent negative - This is an expected negative when testing for drugs that are not the prescribed (or related) medications
- Inconsistent negative - This is an unexpected result, i.e. the patient was prescribed medication but because it was not detected consistently it may indicate that the patient may be diverting, not taking the medication properly, has an unexpected metabolism of the drug, or there is interference from an, alternative medication.

[Read more on our website](#)

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**Aria Diagnostics is a CAP accredited laboratory specializing in high-quality drug testing.**

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