

# Guidelines for Therapeutic Drug Monitoring of Antiepileptic Drugs

Toshiaki Sando

Japanese Society of Therapeutic Drug Monitoring (JSTDM), Okayama University Hospital,  
JAPAN

## Scope of the lecture:

The standard guidelines for TDM of antiepileptic drugs was published by the Japanese Society of TDM as a book. In this lecture, the usefulness of this guideline in the TDM practice will be introduced.

## Learning objectives:

1. To learn the essential points of antiepileptic drugs required for TDM practice from “Statement” in the guideline
2. To apply the clinical questions for TDM practice from “Summary” in the guideline.

## Extended abstract:

The number of antiepileptic drugs is dramatically increased, and about 20 drugs are used. Especially, about 10 drugs have been approved as new antiepileptic drugs since the 1990s. Along with this, options for individualized therapy have expanded, and it is also necessary to pay more attention to the drug interaction. In addition, antiepileptic effects may be affected by liver function, kidney function and age, etc. Therefore, individual differences are significant in the therapeutic and side effects of antiepileptic drugs, and Therapeutic Drug Monitoring (TDM) in the clinical practice is a very important in determining the dosage regimen. However, there were no standard guidelines for TDM of antiepileptic drugs. For this reason, the Japanese Society of TDM (JSTDM) published a TDM guideline 2017 for antiepileptic drugs as a book. The purpose of this guideline is to improve the quality of TDM of antiepileptic drugs. In addition, we aim to appropriately evaluate changes in blood concentration of antiepileptic drugs and improve the quality of medical treatment.

This guideline consists of basic knowledge of each drug and clinical questions (CQs) and a summary of the answer and explanation. We summarized the 10 drugs mainly used in Japan such as benzodiazepine, carbamazepine, gabapentin, lamotrigine, levetiracetam, phenobarbital, phenytoin, sodium valproate, topiramate and zonisamide. This guideline consists of eleven common CQs, and it contains answers based on clinical evidence for each drug. The contents of CQs are specifically described every drug as shown below. Recommended blood sampling points and sample types; recommended target blood concentrations; measurement errors and cross-reactivity between instruments; the necessity of metabolites measurement; management in case of insufficient effect or suspected side effects;

drug interaction requiring caution; frequency of measurement of blood concentration in special condition such as hepatic failure, renal failure, dialysis and pregnancy; and necessity of examination of gene polymorphisms involved in fluctuation in blood concentration.

In the future, the treatment of epilepsy is anticipated to change with the times as drug combinations and therapeutic strategy by the introduction of new antiepileptic drugs, so this guideline will be periodically revised by including evidence for new antiepileptic drugs. We hope that this guideline will be useful for all medical professionals for TDM of antiepileptic drugs.