

THE PATHCARE NEWS

ANTICONVULSANT THERAPEUTIC DRUG MONITORING

We are proud to announce the expansion of our anticonvulsant therapeutic drug monitoring (TDM) offering to enhance personalized pharmacotherapy. Anticonvulsant drug level testing is available for the following:

- Perampanel (*Fycompa*)
- Oxcarbazepine (*Trileptal*) (including the 10-OH-Carbamazepine active metabolite)
- Pregabalin (*Lyrica*)
- Levetiracetam (*Keppra*)
- Lamotrigine (*Lamictal*)
- Gabapentin (*Neurontin*)
- Topiramate (*Topamax*)
- Carbamazepine with Carbamazepine-epoxide (major active metabolite)
- Phenytoin
- Valproate
- Lacosamide

Indications for anticonvulsant Therapeutic Drug Monitoring include

- Dose optimization after initial prescription or after dose adjustment
- Clinical non-response, relapse, or recurrence of symptoms at recommended dosing
- Determination of drug adherence
- Clinical improvement but with adverse effects while using recommended dosing
- Tolerability issues
- Risk or suspicion of drug-drug interactions
- Presence of genetic concern relating to drug metabolism
- Patient with extremes of body weight
- Pregnant or breastfeeding patients
- Children and adolescent patients
- Elderly patients
- Pharmacological relevant comorbidities (e.g., hepatic, renal or cardiovascular disease)
- Acute or chronic inflammation or infection
- Patients with potential gastrointestinal absorption concerns (e.g., bariatric surgery, GI resection)
- Lack of efficacy or concern for toxicity occurring after switching between manufacturers of a drug
- Pharmacovigilance programs
- Documentation of optimal concentration in the well-controlled for future reference

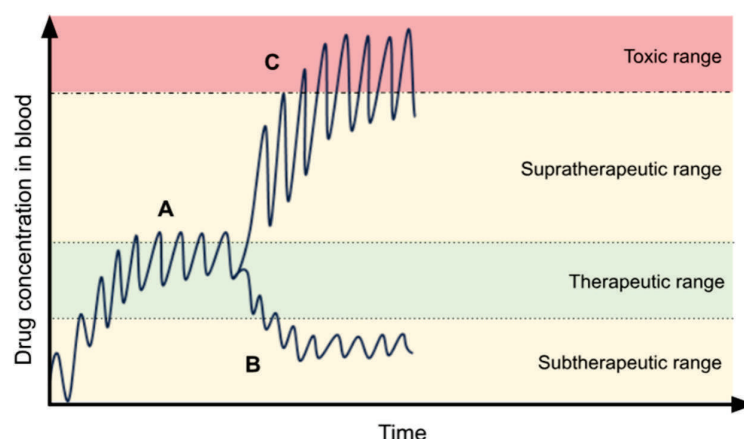


Figure 1: Concentration time curve after administration of medication, depicting (A) optimal dosing, (B) inadequate dosing, and (C) toxic dosing. Figure adapted from the Consensus Guidelines for Therapeutic Drug Monitoring in Neuropsychopharmacology (2017 update)

Operational details

- **Timing:** Steady state trough level collection is optimal
- **Sample type:** Serum (yellow-top SST tube)
- **Sample stability:** 2 days on ice
- **Methodology:**
 - Perampanel, Oxcarbazepine (and 10-OH-Carbazepine), Pregabalin, Levetiracetam, Lamotrigine, Lacosamide, Gabapentin and Topiramate: state-of-the-art Liquid Chromatography Mass Spectrometry (LCMS) methodology to ensure gold-standard accuracy as recommended by international guidelines
 - Carbamazepine can be tested using either immunoassay or LCMS methodology (however, the Carbamazepine-epoxide active metabolite is only reportable using the LCMS method). Please specify "LCMS" if the Carbamazepine-epoxide active metabolite is required.
 - Phenytoin and Valproate: Immunoassay only
- **Turn-around-time:**
 - Immunoassay: <1 day
 - LCMS: ~1-3 days

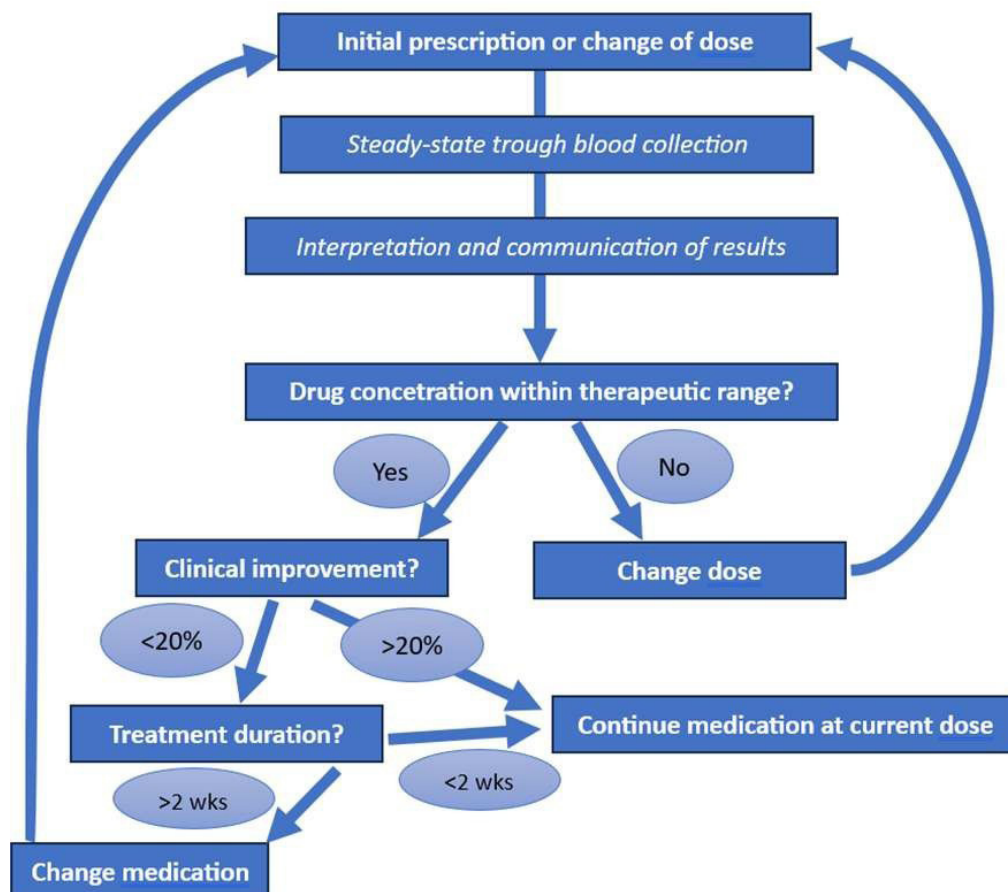


Figure 2: TDM-guided dose titration algorithm. Figure adapted from the Consensus Guidelines for Therapeutic Drug Monitoring in Neuropsychopharmacology (2017 update)

Further reading

Hiemke C, Bergemann N, Clement HW, Conca A, Deckert J, Domschke K, et. al. Consensus Guidelines for Therapeutic Drug Monitoring in Neuropsychopharmacology: Update 2017. Pharmacopsychiatry. 2018 Jan;51(1-02):9-62. doi: 10.1055/s-0043-116492. Epub 2017 Sep 14. Erratum in: Pharmacopsychiatry. 2018 Jan;51(1-02):e1. PMID: 28910830.

Please feel free to contact a Chemical Pathologist for further information or discussion.