# Checklist for Phenytoin Pharmacokinetic Dosing and Monitoring[1]

## Pre-Dosing Background Information Gathering (from chart +/- in discussion with preceptor)

- ✓ Confirm indication (i.e. type of seizure); confirm when last seizure occurred. If seizures pre-existing, confirm frequency of seizures in the past
- ✓ Review for potential drug interactions with current prescription (Rx) meds, non-Rx meds, natural health products (NHPs) and alternative medicines
- ✓ Confirm allergies status
- ✓ Confirm pregnancy & lactation status (If Applicable)
- ✓ Confirm that patient has no contraindications: i.e. allergic to hydantoin products
- ✓ Review patient's previous phenytoin levels, if any, and if doses were altered as a result (check both outpatient and inpatient records)
- ✓ Review the pharmacokinetics of phenytoin via class notes or alternative sources. If available, ask the preceptor for a local phenytoin dosing and monitoring guideline.*

## Initial Phenytoin Dosing

- ✓ Establish patient weight, serum creatinine, eGFR, BUN, and albumin
- ✓ Identify target pre-phenytoin level
- ✓ Identify if a phenytoin loading dose is needed
- ✓ Calculate the initial loading dose (if needed), maintenance dose, route and frequency according to patient weight, presence/absence of clinical symptoms, kidney function and ability to adhere to therapy

## Therapeutic Drug Monitoring

- ✓ Identify if a phenytoin serum level should be ordered. Here are examples of when levels should be ordered:
  - ☐ Recent medication initiation. Typically, a level is taken 2-4 hours post IV or 24 hours post PO load. Generally, a trough level (within 30 to 60 minutes prior to next dosage administration) is then drawn within a few days after phenytoin maintenance dose gets started and will be repeated after 1-2 weeks until there is a steady level of drug in the body (7-21 days). Levels can then be monitored every 3 months to 1 year depending on stability of condition being treated and patient.
  - ☐ Recent medication titration (repeat level ~5-7 days following any dose change).
  - ☐ Recent change in route of administration (PO, NG, IV)
  - ☐ Acute seizure episode
  - ☐ Query adherence to medication
  - ☐ Query absorption of medication
  - ☐ Addition of an interacting medication
  - ☐ Presence of dose related side effects or if toxicity presents:
    - Nausea, stomach discomfort
    - Confusion or slurred speech, drowsiness
    - Chest pain or tightness or irregular/pounding heart beat
    - ☐ Uncontrolled eye or muscle twitching
    - ☐ Light headedness or fainting, dizziness
  - ☐ Change in renal function
  - ☐ Patient is obese (>125% IBW), pregnant, pediatric or hypermetabolic (e.g. burn patient, cystic fibrosis)
  - ☐ Significant changes in hepatic function
- ✓ If a level is necessary, the following should be considered:
  - ☐ Is the drug at steady state? (e.g. 7-21 days, note: time to steady state is variable and can range from 3-50 days)
  - ☐ Were there any missed doses?
  - ☐ Were the previous doses given at the appropriate time? If NG, were feeds held before and after administration?
  - ☐ Are there any drug interactions?
  - ☐ Is an albumin level available to calculate the corrected level?
  - ☐ Is a free phenytoin level required? (e.g. in presence of uremia, dialysis, severe hypoalbuminemia, seizures/toxicity with target concentrations)

## Drug Levels Interpretation

- ✓ Interpretation and documentation of the drug level should encompass the following:
  - ☐ ID
    - Indication
    - Phenytoin dosing, route of administration, and frequency
    - Date of last dose given/change (if applicable)
  - ☐ Subjective
    - Signs and symptoms relevant to phenytoin related adverse effects or lack of efficacy
  - ☐ Objective
    - Relevant vitals and laboratory parameters for resulted and pending results (if available)
    - Phenytoin level (include time/date for when the level was drawn)
    - Corrected or free phenytoin level (if applicable)
    - Intended target pre-phenytoin (corrected/free) phenytoin level based on clinical indication
  - ☐ Assessment
    - Review the following when interpreting your level and describe how these can affect your interpretation:
      - Missed doses?
      - Previous doses given at the appropriate time?
      - True trough level (within 30minutes to 60 minutes prior to next dosage administration)?
      - Corrected level given other laboratory parameters?
      - Were there interactions with other medications that can affect the interpretation of the level?
    - Is the level subtherapeutic, therapeutic and supratherapeutic?
      - Is the level representative of steady state? And how would this affect your interpretation of the drug level?
      - How does this level compare to previous levels the patient has had as an out-patient or inpatient? Is the patient experiencing the same or different level of seizure control now as compared to when those levels were taken?

- Is dose adjustment or discontinuation needed?
  - What new regimen would you recommend?
  - Is a mini-load needed?
  - Is titration schedule needed?

☐ Plan

- Suggestion for subsequent phenytoin dose, route and frequency
- Suggestion for subsequent monitoring (i.e. repeat drug level or other lab work if necessary)

**Subsequent Laboratory Monitoring**

✓ Repeat level ~5-7 days following any dose change, or if patient seizes, or if toxicity presents, if drug interactions are suspected, or if any significant changes in hepatic function occur.

✓ Once desired therapeutic range is reached and there is a steady sate of drug level in the body levels can be monitored every 3 months to 1 year as needed.

✓ Repeat CBC, LFTs, INR, albumin, serum creatinine as necessary

* If not available at their site, here is a link to a phenytoin empiric dosing guideline: http://www.vhpharmsci.com/vhformulary/tools/Phenytoin-Kinetic-Monitoring.htm