Phenytoin – Loading Dose Guide (Adults)

Check the drug history

If a patient is already taking regular phenytoin (Epanutin) reliably they may not need to be loaded – go straight to IV maintenance dose below. Do not delay treatment in an emergency but consider a plasma level in loss of seizure control, or in suspected toxicity or poor compliance. Note samples need to be sent to PGH so will take time.

IV loading dose

20mg / kg
Write “LOADING DOSE” on the prescription
Add dose to 50 - 100mL of 0.9% sodium chloride
Final concentration not to exceed 10mg/mL
Loading doses greater than 1g should be diluted to 250mL

Administration of IV loading dose

Administer via a large vein through a large gauge needle or IV catheter via a rate controlled infusion pump, preferably through a 0.2 micron filter
Maximum IV administration rate = 50mg / minute
Administration must be completed within 1 hour of preparation

Compatible infusion fluids

Sodium chloride 0.9%
Do not infuse or mix with any other IV fluids or medicines as precipitation may occur

Flushing

Sodium chloride 0.9% before and after IV administration to avoid local venous irritation

Monitoring

Monitor ECG, heart rate and blood pressure during IV loading dose. Rapid IV administration may result in hypotension, CNS depression, arrhythmias, cardiovascular collapse, respiratory arrest, tonic seizures.

Avoid the IM route

The intramuscular route is painful and not recommended as crystallisation may occur

IV maintenance dose

100 mg IV every 6 to 8 hours. Doses adjusted depending on plasma levels.
If using neat injection, give as slow IV injection (over two minutes)
If giving as an IV infusion, a 0.2 micron filter must be used and infusion completed within 1 hour of preparation.
Monitor for adverse effects from IV therapy (see above). Monitor plasma levels.

Oral Maintenance dose

Initially 3 to 4 mg / kg once daily PO
Usual dose is 200 to 500mg daily PO, depending on plasma levels

Bioavailability

100mg capsule / tablet / injection is bioequivalent to 90mg suspension
Suspension strength = 30mg in 5mL

Therapeutic drug monitoring

Phenytoin displays non-linear saturation kinetics, hence a small increase in dose may result in a much larger increase in serum level
Hypoalbuminaemia will increase the amount of free phenytoin; therefore a patient with a low albumin can have a phenytoin level within range and still be toxic; the reported level will require correcting if the patient has a low albumin. (Contact Pharmacy for advice).
Accepted therapeutic range = 10 to 20 mg/L
Take a level 2-3 days after initiation, then again 3-5 days later. If no change in plasma level monitor weekly.
Once established on phenytoin, take a level 2-4 weeks after change in dose or oral formulation, or after stopping/staring a potentially interacting drug (see list below).

Ideal sampling time

At least 4 to 6 hours post IV dose
Immediately prior to next oral dose (trough)

Major factors influencing serum levels

Liver impairment, hypoalbuminaemia. Interacts with enteral feeds (stop feed 2 hrs before and after dose).
Interacting medicines e.g. antiepileptics, antifungals, antipsychotics, amiodarone, chloramphenicol, cimetidine, ciprofloxacin, diltiazem, dronedarone, metronidazole, nifedipine, SSRIs, St John’s wort, trimethoprim, tri-cyclic antidepressants, hydroxychloroquine, warfarin.
This is not an exhaustive list. Refer to the BNF or Ward Pharmacist.