

Phenytoin Loading Guidelines For Status Epilepticus (Acute Services)

Parenteral Phenytoin is an antiepileptic used for the control of status epilepticus and seizures due to head trauma. **These guidelines apply to adults only.**

Drug Presentation:

Phenytoin is available as a 50mg/ml (250mg/5ml) injection. If the injection or infusion has precipitated or is hazy it should be discarded.

- Continuous ECG monitoring is mandatory when administering this drug.
- For administration on designated areas only - A&E, Intensive Care areas, Acute Admissions Unit.

Status Epilepticus-Loading Dose

1. For patients not previously receiving phenytoin : 18mg/kg

Preparation:

Dilute with sodium chloride 0.9% to a maximum concentration of 10mg/ml e.g. 1000mg in 100ml. The solution must be given immediately.

Administration:

DO NOT ADMINISTER INTRAMUSCULARLY

Intravenous Bolus:

Rate should **NOT** exceed 50mg/min (e.g. 20 minutes for a 1000mg dose). Administer into a large vein via a large gauge needle or IV catheter.

Intravenous Infusion:

Rate should NOT exceed 50mg/min. The infusion must be completed within one hour. Administer via an in-line filter (0.22-0.5micron) which is available on the ward. Sterile saline should be administered prior to and following phenytoin administration through the same access site to avoid local irritation and to ensure adequate venous flow.

Important Side-effects:

CNS and cardiac depression, hypotension, local tissue irritation, arrhythmias. Cardiac resuscitation equipment should be available.

Monitoring:

ECG, blood pressure, signs of respiratory depression.

Blood levels should only be taken if the patient shows signs of toxicity or is uncontrolled. This should be taken immediately prior to the next dose and levels of 10-20mg/litre aimed for.

References:

1. British National Formulary
2. Manufacturers Datasheet Compendium 2010.
3. Handbook of Clinical Drug Data, 8th Edition, 1997-98.
4. A Thomson, Clinical Pharmacokinetics Unit, Glasgow, November 1995

Phenytoin Guidelines For Maintenance therapy (Acute Services)

Maintenance Dose : 5mg/kg/day (IV or oral as appropriate)

Monitoring Concentrations

Target Range : 10 – 20 mg/L

Sampling Time : predose not critical

Ideally samples should be taken after at least 5 days of maintenance therapy but may be taken earlier if toxicity is suspected or if a patient fails to respond. Steady state may not be reached until 2-3 weeks treatment at a constant dose.

Dose Adjustment

The relationship between phenytoin dose and steady state concentration is non-linear i.e. when the dose is doubled the concentration will increase disproportionately. The following guidelines may be useful if a dosage adjustment is clinically indicated.

Concentration (mg/L)	Dose	Dose Increase
<5	<4mg/kg/day	100mg
<5	4.5-6.0mg/kg/day	check compliance
5 - 10	4.5-6.0mg/kg/day	50mg
5 - 10	>6mg /kg/day	check compliance
>10		25mg

Phenytoin Formulations

Phenytoin sodium 100mg capsules/tablets/ injection = phenytoin suspension 90mg in 15ml

Factors Affecting Phenytoin Concentrations

Protein Binding

Binding can be reduced in renal impairment, hypoalbuminaemia and pregnancy. This affects the interpretation of concentration measurements.

The following equation can be used to correct the total phenytoin concentration for low albumin:

$$\text{Corrected concentration} = \frac{\text{Concentration observed}}{(0.9 \times \text{albumin concentration} / 44 \text{ g/L}) + 0.1}$$

Drug Interactions

Phenytoin concentrations can be increased or decreased by other drugs. Check the current BNF for details.

References:

1. British National Formulary
2. Manufacturers Medicines Compendium 2010.
3. A Thomson, Clinical Pharmacokinetics Unit, Glasgow, November 1995