Intravenous Phenytoin for Status Epilepticus in Adults

Indication: Status Epilepticus

**Loading dose: Patients who are NOT on phenytoin prior to admission**

**Loading Dose:** 20mg/Kg via Intravenous infusion

<table>
<thead>
<tr>
<th>Weight (KG)</th>
<th>Loading dose of Phenytoin (250mg/5mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 – 54</td>
<td>1000mg (20mL)</td>
</tr>
<tr>
<td>55 – 64</td>
<td>1200mg (24mL)</td>
</tr>
<tr>
<td>65 – 74</td>
<td>1400mg (28mL)</td>
</tr>
<tr>
<td>75 - 84</td>
<td>1600mg (32mL)</td>
</tr>
<tr>
<td>85 – 94</td>
<td>1800mg (36mL)</td>
</tr>
<tr>
<td>&gt;95</td>
<td>2000mg (40mL) max dose</td>
</tr>
</tbody>
</table>

“Top up” dose: Patients who are currently taking phenytoin

Use a recent phenytoin level (last 24-48 hours) and correct this using the formula below for patients with hypoalbuminaemia prior to calculating the top-up dose.

Top-up phenytoin sodium dose (mg) = [20 – (phenytoin level (mg/L)] x 0.7 x weight(kg)

**Administration:**

<table>
<thead>
<tr>
<th>Loading dose of Phenytoin</th>
<th>Administration instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1g</td>
<td>In 100mL NaCl 0.9% infuse via a volumetric pump- with 0.2 micron filter (20 minutes) into large vein</td>
</tr>
<tr>
<td>1g - 2g</td>
<td>In 250mL NaCl 0.9% infuse via a volumetric pump- with 0.2 micron filter (40 minutes) into large vein</td>
</tr>
</tbody>
</table>

Infusions for loading dose must be completed within 1 hour of dilution. Observe product for crystal formation, if this occurs stop the infusion and inform the prescriber.

Maximum rate 50mg/min. In elderly patients or those with pre-existing cardiac disease, consider infusing at a rate 25mg/min and titrate accordingly against the monitoring parameters.

Before and after the infusion of phenytoin the needle or the catheter must be flushed with sodium chloride 0.9%.

**Monitoring:**

Continuous BP, RR and ECG monitoring is essential for all IV infusions. If bradycardia or hypotension occurs halve the infusion rate (to 25mg/min). Ensure the infusion is completed within one hour of dilution.

**Level post loading:**

Take a level 6 - 24 hours after loading dose, see below to correct PPM reported level for patients with hypoalbuminaemia. Levels can be monitored every 24 hours until seizure control is achieved (and is recommended for high risk patients: liver impairment, hypoalbuminaemia, malabsorption, lack of seizure control and patients on concomitant medication that interact (via CYP iso-enzymes).

**Therapeutic drug monitoring:**

Target phenytoin level is 10-20mg/L
(Level is different if patient is also prescribed sodium valproate: 5-10mg/L)
Hypoalbuminaemia:

PPM reported level does NOT correct the phenytoin level if patient’s Albumin is <35g/L. In critically ill patients this calculation acts as a guide in the context of the patient’s clinical condition due to rapidly changing albumin levels.

\[
\text{Corrected level (mg/L) = Phenytoin level (mg/L)} \times \frac{[0.02 \times \text{serum albumin (g/L)}] + 0.1}{100} 
\]

Maintenance dose:

Start 8 hours after loading dose

**ICU:** IV administration preferred within critical care due to interactions with 24 hour NG feeds and presence of continuous ECG and BP monitoring.

**Wards:** Dose based on 3-4mg/kg/day

- Phenytoin sodium capsules: 300mg oral once daily
- Phenytoin base liquid: 270mg NG/Enteral once daily
- Phenytoin sodium IV: 100mg IV three times daily
  - Administer neat as a bolus over 2-5 minutes.

A 2 hour break pre and post feed (interaction with protein within feed) must be maintained, speak to the dieticians to tailor the feed.

Levels for maintenance dose:

Take a trough level 2 days after initiation, then again 3-5 days later. If no change in plasma level/albumin status, then monitor every 7 days. Frequent levels may be needed if on interacting medication (via CYP iso-enzymes), liver impairment, hypoalbuminaemia, malabsorption and lack of seizure control.

Maintenance dose adjustment:

<table>
<thead>
<tr>
<th>Measured concentration</th>
<th>Maximum dose increase / day</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5mg/L</td>
<td>100mg</td>
</tr>
<tr>
<td>5-10mg/L</td>
<td>50mg</td>
</tr>
<tr>
<td>10-20mg/L</td>
<td>25mg</td>
</tr>
<tr>
<td>&gt;20mg/L</td>
<td>Withold dose and check levels every 24 hours until target concentration achieved (10-20mg/L). New maintenance dose recalculated</td>
</tr>
</tbody>
</table>

After a change in maintenance therapy take a trough level 3-5 days after or more frequently (as above). The pharmacokinetics of phenytoin are non-linear, therefore a small dose increase can produce a large increase in phenytoin levels.

This document is intended for guidance only. If uncertain, contact Neurology / Pharmacy for further information or clarification. Refer to the manufacturing information (SmPC) or BNF on drug interactions, monitoring requirements, cautions and contraindications.

Information adapted from various resources
(All references listed within LGI Adult Cluster/Neurosciences/Neurosurgery/Antiepileptics)
Sidra Awan Specialist Clinical Pharmacist 10/2019. QA check by Elizabeth Drewe Advanced Clinical Pharmacist 10/2019
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This information has been prepared by Leeds Medicines Management and Pharmacy Services for use by health care professionals at Leeds Teaching Hospitals NHS Trust.

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