

## Who can administer

May be administered by registered competent doctor or nurse/midwife

## Important information

- **LOADING dose depends on weight** (see dose below)
- **NEVER exceed the maximum rate** of administration (50mg per minute)
- There are **numerous important drug interactions** - check latest BNF
- **In-line filter MUST** be used
- **Flush line PRE and POST** infusion with Sodium chloride 0.9% to minimise phlebitis

## Available preparations

Epanutin 250mg per 5mL ampoule

Phenytoin 250mg per 5mL ampoule (Mercury brand)

## Reconstitution

Already in solution

**Draw up using a 0.2 micron filter needle**

## Infusion fluids

Sodium chloride 0.9% **only**

## Methods of intravenous administration

**Intermittent intravenous infusion (preferred route for both loading and maintenance doses)**

**Administer using an electronically controlled infusion device**

- Administer into a large vein through a large-gauge needle or IV catheter
- Add required dose to a suitable volume of infusion fluid - **the concentration cannot exceed 10mg/1mL** (see table 1 below)

**Table 1: Dilution of Phenytoin injection**

Required dose	Volume of Sodium chloride 0.9%
Less than 500mg	50mL
500mg to 1000mg (loading doses)	100mL
Greater than 1000mg (loading doses)	250mL

- The rate of administration **cannot exceed 50mg per minute** - example 1400mg as loading dose over at least 30 minutes
- A rate of 25mg per minute or lower may be appropriate in some patients including the elderly and

those with heart disease <sup>(ref 2)</sup>

- Administration should commence immediately after the mixture has been prepared and must be completed within **60 minutes**
- An in-line 0.2 micron filter **must** be used, available from Pharmacy (Braun filter 0409 9303)

### Slow intravenous injection (maintenance doses only) (infusion preferred)

- Administer at a rate **not exceeding 50mg per minute**
- A rate of 25mg per minute or lower may be appropriate in some patients including the elderly and those with heart disease <sup>(ref 2)</sup>
- Administer into a large vein through a large-gauge needle or IV catheter

### Important

- Each injection or infusion of phenytoin should be preceded and followed by an injection of sterile sodium chloride 0.9% through the same needle or catheter to avoid local venous irritation due to alkalinity of the solution
- **Ensure remainder of drug solution in the administration set is administered - flush through with Sodium chloride 0.9% at the same rate at which the phenytoin was given**

## Dose in adults

### Status epilepticus only <sup>(ref 5)</sup>

- Give a loading dose of 20mg/kg to a maximum dose of 2000mg- see table 2 below
- The loading dose should be followed by **maintenance doses** of 100mg orally or IV every six or eight hours

**Table 2: Phenytoin loading dose in status epilepticus** <sup>(ref 5)</sup>

Body weight (kg)	Loading dose 20mg/kg (to a max dose of 2000mg)
40	800mg
50	1000mg
60	1200mg
70	1400mg
80	1600mg
90	1800mg
100kg or more	2000mg (maximum dose)

### General dosage information

- **Dosage increases should be gradual** (saturable metabolism)
- Patients with impaired liver function, elderly patients or those who are gravely ill may show early signs of toxicity
- **Therapeutic drug monitoring is required:** See under Monitoring below
- **Intravenous to oral switch:** see table below <sup>(ref 3,4)</sup>

Intravenous dose	Oral capsule equivalent dose	Oral suspension equivalent dose <sup>(ref 3)</sup>
Phenytoin (sodium) 100mg <b>three times a day</b> IV	Phenytoin (sodium) capsules 300mg <b>once daily</b>	Phenytoin (base) suspension 270mg <b>once daily</b>
When changing from <b>intravenous to oral doses</b> - either capsules or suspension, the total dose should be administered once daily		
When changing from <b>oral to intravenous doses</b> - the intravenous dose should be given in divided doses		

## Monitoring

- Continuous ECG and BP monitoring is required
- Monitor respiratory rate
- Monitor injection site during and for 72 hours following administration <sup>(ref 2)</sup>
- Adjust dose as per levels below, as clinically indicated

<b>Therapeutic range (total phenytoin*)</b>	10 to 20mg/L (40 to 80micromol/L)
<b>When to take levels</b> <sup>(ref 4)</sup>	<ul style="list-style-type: none"> <li>• Take a level 6 to 24 hours after loading dose</li> <li>• However, if rapid therapeutic levels are needed, initial levels may be drawn 2 hours after the IV loading dose, to aid determination of maintenance dose or need to reload</li> <li>• Take a trough level 2 days after initiation, then again 3 to 5 days later.</li> <li>• If no change in plasma level/albumin status, then monitor every 7 days</li> <li>• More frequent levels may be needed in: high risk patients (liver impairment, hypoalbuminaemia, malabsorption, lack of seizure control and patients on concomitant medication that interact via CYP isoenzymes)</li> <li>• Check serum levels 5 to 7 days following any change in dose <sup>(ref 1)</sup></li> </ul>
<b>Time to steady-state</b> <sup>(ref 1)</sup>	<b>Normally</b> 5 to 10 days

\* as only **free-phenytoin** is pharmacologically active, **total phenytoin levels may be misleading** in uraemia, renal failure, hypoalbuminaemia, elderly patients or in patients taking drugs which displace phenytoin from albumin e.g. sodium valproate

**Note: Free phenytoin levels are currently unavailable in this hospital.** There are methods to determine corrected phenytoin levels in patients with renal or hepatic disease, or in those with hypoalbuminaemia. For example, see [MDCalc](#), or [ClinCalc](#)

## Storage

- Store below 25°C
- Do not use if a precipitate or haziness develops in the ampoule or diluted solution

## References

SPC (Epanutin) March 2023

1: Uptodate: downloaded Jan 26th, 2024

2: Injectable medicines guide, downloaded from Medusa 14th March 2024

3: Handbook of Drug administration via enteral feeding tubes- accessed online via medicinescomplete  
14th March 2024

4: Leeds teaching hospital: Intravenous Phenytoin for Status Epilepticus in adult November 2022

5: Status epilepticus, [GUH treatment algorithm for adults, March 2023](#)

## Therapeutic classification

Anti-epileptic