

PHENYTOIN

Trade Name	Phenytoin Injection BP (DBL)		
Class	Anticonvulsant		
Mechanism of Action	Stabilises neuronal membranes by affecting sodium ion concentration in the cells of the motor cortex during generation of nerve impulses.		
Indications	Seizures – second-line		
Contraindications	Hypersensitivity to phenytoin, sinus bradycardia. Caution when used in situations of hypoalbuminemia or altered protein binding states (e.g. renal failure, hyperbilirubinaemia)		
Supplied As	100 mg/ 2 mL (= 50 mg/mL) of phenytoin sodium in 2 mL ampoule for iv injection		
Dilution	Dilution is not recommended by manufacturer due to lack of solubility and possibility of precipitation.		
	However, if the dose volume is <0.5 mL(25 mg) then will need to further dilute before infusing via the T34 pump – see chart below		
	Dilution if final dose required is <0.5 mL(25 mg)		
	Drug	0.9 % Saline Added	Final Volume
50mg (1mL)	4 mL	5 mL	10 mg/mL
If dilution is required, prepare immediately before use			
Dosage	Loading dose: 20 mg/kg single dose Maintenance: 2.5 mg/kg/dose (range 2 – 5 mg/kg/dose)		
Interval	Loading dose: Single dose Maintenance: 12 hourly (commence 12 hours after the load)		
Administration	Loading dose: IV infusion over 20 min (max. infusion rate 1 mg/kg/min) IV site should be flushed with sodium chloride 0.9 % before and after administration. Maintenance: IV infusion over 2-5 min, rate 1mg/kg/min Oral (absorption can be unpredictable)		

.... Administration	Avoid concurrent administration with any other medication or IV solution due to risk of precipitation. If infused as a diluted solution an inline 0.22 – 0.5 micron filter must be used. Do not give IM as phenytoin can crystallise in muscle.
Compatible With	Solution: sodium chloride 0.9% Y- site compatibility: famotidine fluconazole
Incompatible With	Do not mix with any other medication. Incompatibilities have been reported with: dextrose/glucose solutions, amikacin, aminophylline, cefepime, clindamycin, dobutamine, enalapril, heparin, hydrocortisone, insulin, lidocaine, morphine, phenobarbital, potassium chloride, propofol, ranitidine, sodium bicarbonate
Interactions	Chloramphenicol and Omeprazole increase phenytoin concentrations. Phenytoin decreases steroid and midazolam concentrations. Hypotension may occur when dopamine and phenytoin used concurrently. Folic Acid with phenytoin may increase seizure frequency
Monitoring	Serum trough levels: 48 hrs post IV loading dose (require 1mL of plasma for assay). Therapeutic level: Total phenytoin: 40 - 80 micromol/L Free phenytoin: 4 - 9 micromol/L. Monitor for hypotension, bradycardia or arrhythmias during infusion and monitor IV to avoid extravasation
Stability	Use only clear solutions (phenytoin IV solution is stable when free of haziness and precipitate). Discard ampoule after initial usage. Diluted solution should be administered with 1 hour of preparation.
Storage	Room temperature. Protect from light. Do not refrigerate
Adverse Reactions	Toxicity can cause drowsiness, nystagmus, hypotension, bradycardia, arrhythmias, hyperglycaemia, gingivitis, temperature instability. Hypersensitivity has been reported. Extravasation can cause inflammation and tissue necrosis.
Metabolism	Serum half life is 18-60 hrs. Phenytoin is metabolised by the liver. 85 - 90% is protein bound. Bilirubin will displace phenytoin from protein binding sites thereby increasing free drug.
Comments	Contains 0.2 mmol sodium/ mL. If diluting phenytoin keep concentration between 1-10 mg/mL for stability.

References	<ol style="list-style-type: none"> 1. NZHPA Notes on Injectable Drugs 5th Edition. 2. www.noids.nz 3. Trissell Handbook on Injectable Drugs 10th Edition. 4. Neofax, in www.micromedexsolutions.com 5. J Clin Pharm 1994;34(4) 312 6. NEJM 1999; 341(7) 485-9 7. Neurology 1981; 31:1107 8. www.ANMFonline.org 9. Starship Guidelines www.starship.org.nz
Updated By	<p>P Schmidt, B Robertshawe, October 2004 A Lynn, B Robertshawe, F Robertson May 2009 (new pumps) A Lynn, B Robertshawe September 2009 A Lynn, B Robertshawe ,June 2010 guardrail off A Lynn, B Robertshawe Dec 2012 (re-order profile), Dec 2014 level units A Lynn, M Wallenstein, B Robertshawe May 2021 (review/update dosing)</p>