PHENOBARBITAL

<table>
<tr><td>Trade Name</td><td>Phenobarbital Sodium (injection) Martindale Pharmaceuticals
Oral mixture alcohol free made up by Pharmacy</td></tr>
<tr><td>Class</td><td>Anticonvulsant</td></tr>
<tr><td>Mechanism of Action</td><td>Limits the spread of seizure activity, by enhancement of GABA binding to neuro-inhibitory receptors</td></tr>
<tr><td>Indications</td><td>Indication 1: Seizures
Indication 2: Sedation
Indication 3: Non-narcotic drug withdrawal
Indication 4: Enzyme induction prior to HIDA scan</td></tr>
<tr><td>Contraindications</td><td>Hypersensitivity to phenobarbital
History of porphyria (barbiturates can aggravate/worsen porphyria by inducing enzymes involved in synthesis of porphyrins)
Caution when used in renal and hepatic disease</td></tr>
<tr><td>Supplied As</td><td>IV: 200 mg/mL phenobarbital sodium
(20 mg/0.5 mL occasionally supplied when stock short)
Must be diluted to 20 mg/mL prior to administration
Oral: 10mg/mL</td></tr>
<tr><td>Dilution
Due to a worldwide shortage of phenobarbital, draw up the required dose and then store the remainder of the solution in a labelled syringe in the fridge to be used if needed for subsequent doses. Discard syringe after 24 hours.</td><td>
<table>
<tr><th>Drug</th><th>0.9% Sodium Chloride Added</th><th>Final Volume</th><th>Concentration</th></tr>
<tr><td>200 mg (1 mL)</td><td>9 mL</td><td>10 mL</td><td>20 mg/mL</td></tr>
</table>
Maximum Single dose = 100 mg (5mL) unless documented by two Drs/CNS-ANP
If the dose volume is <0.5mLthen will need to further dilute before infusing via the T34 pump (see T34 protocol)</td></tr>
<tr><td>Dosage</td><td>Indications 1,2: Loading dose
20 mg/kg/dose
Further doses of 10 mg/kg/dose may be given up to a total of 40 mg/kg for seizures.
Indications 1,2,3: Maintenance dose
3 – 4 mg/kg/dose
May need to increase to 5mg/kg/day after 1-2 weeks as phenobarbital clearance is expected to increase by this time.
Indication 4: 5 mg/kg/day orally for 5 days prior to a HIDA scan</td></tr>
</table>

Interval	**Loading dose:** Single dose with repeat doses as above when clinically required for seizure control **Maintenance:** Once a day, if given a loading dose then start maintenance 12-24 hours afterwards
Administration	**Loading dose:** Give IV over 20 minutes **(max 1 mg/kg/minute)** **Maintenance:** Oral or IV slow push
Compatible With	**Solutions:** 5% dextrose, 10% dextrose, 0.45% sodium chloride, 0.9% sodium chloride, lactated Ringer's, **Y-site compatibility with:** aciclovir, amikacin, aminophylline, amphotericin liposomal, atropine, benzylpenicillin*, calcium chloride, calcium gluconate, cefazolin, ceftazidime, clindamycimagnesium sulpn, dexamethasone, dexmedetomidine, dopamine, doxapram, epoetin alfa, erythromycin*, famotidine, fentanyl, furosemide, ganciclovir, heparin, hydrocortisone, ibuprofen, indometacin, insulin, lidocaine, magnesium sulphate, meropenem, methylprednisolone, metronidazole, milrinone, morphine, octreotide, piperacillin + tazobactam, potassium chloride, ranitidine, sodium acetate, odium bicarbonate, tobramycin, TPN, vancomycin, vasopressin, *use with caution compatibility results are variable
Incompatible With	Amiodarone, cefotaxime, dobutamine, diazoxide, gentamicin, insulin, midazolam, noradrenaline, paracetamol, phenytoin, pancuronium, suxamethonium, thiamine, lipid
Interactions	Increased risk of sedation/respiratory depression when used in combination with other CNS depressants Paracetamol: possible decrease in effect due to induction of hepatic enzymes by phenobarbital – prolonged use of both may lead to liver damage. Blood concentrations of digoxin , metronidazole, corticosteroids, vitamin D and betablockers may be reduced when used in combination with phenobarbital. Blood concentrations of phenobarbital may be increased if administered concurrently with phenytoin or sodium valproate
Monitoring	If checking maintenance treatment take trough level 5-7 days (or five half-lives) after loading dose or dose change; if concerned about toxicity or effectiveness of load, take level 6-8 hrs after dose. Serum levels reference range: 65-130 micromol/L (15-30 mcg/ml). If levels too high omit at least one dose before reducing maintenance dose. Consider baseline liver function tests

Stability	**IV:** After dilution with 0.9% sodium chloride draw up the required dose and then store the remainder in a syringe in the fridge for up to **24** hours for use of the same patient if subsequent doses are needed. **Oral:** 30 days at room temperature
Storage	**IV:** Store unopened vials in the Controlled Drugs Safe **Oral:** Store at room temperature
Adverse Reactions	Sedation - levels above 170 micromol/L (40mcg/mL) Respiratory depression – esp. with doses > 30 mg/kg and serum levels above 260 micromol/L (60mcg/mL) Apnoeas, bronchospasm, hypothermia, arrythmias, hypotension, phlebitis, necrosis at injection site, rash, megaloblastic anaemia, folate deficiency, hepatitis, hypocalcaemia, GI upset, Long term use may be complicated by development of tolerance and or physical dependence.
Metabolism	Onset of action after IV administration is within 5 min, peak effect within 30 min. Oral absorption 70-90%. Metabolised mostly in the liver with 20-50% excreted unchanged in urine; clearance can be increased by alkalinisation of urine. Protein binding decreased in neonates. Serum half-life 40-200 hrs (drops after first few wks).
Comments	Controlled drug (C5) In emergency situations out of normal pharmacy hours, the IV preparation can be diluted to a concentration of 10mg/mL with water and given orally *In line with the (NZULM) nomenclature the official generic name of phenobarbitone is now phenobarbital. Community Pharmacy can charge a compounding fee. Prices vary so suggest calling community pharmacy to warn patient of costs.
References	1. Neofax, 1999 & 2000 2. Medicines for Children, RCPCH, 1999 3. J Clin Pharm 1994;34(4) 312 4. NEJM 1999; 341(7) 485-9 5. Neurology 1981; 31:1107 6. Trissel LA, Handbook on Injectable Drugs, 12th Ed, 2003 www.micromedexsolutions.com 7. Milap et al. Stability of phenobarbital sodium diluted in 0.9% sodium chloride injection. AJHP 1986; https://doi.org/10.1093/ajhp/43.2.384 8. www.anmfonline.org
Updated By	A Lynn, B Robertshawe June 2007 A Lynn, B Robertshawe September 2007 A Lynn, B Robertshawe, F Robertson May 2009 (new pumps) A Lynn, B Robertshawe September 2009, June 2010 guardrail A Lynn, B Robertshawe Dec 2012 (re-order profile) A Lynn B Robertshawe May 2018 (update name - phenobarbital as per NZULM) A Lynn, M Wallenstein, B Robertshawe, October 2020 A Lynn, N Austin, M Wallenstein, B Robertshawe Jan 2021 (extended storage of injection due to worldwide shortage.) A Lynn, B Robertshawe Oct 2023 (routine review)