PHENYTOIN

BRAND NAME	PHENYTOIN INJECTION DBL, PHENYTOIN SANDOZ INJECTION
DRUG CLASS	Antiepileptic
AVAILABILITY	Ampoule contains 100 mg/2 mL or 250 mg/5 mL of phenytoin sodium. Also contains propylene glycol, ethanol and sodium hydroxide or hydrochloric acid. The solution is clear and colourless.[1] Contains 0.2 mmol/mL of sodium.[2]
WARNING	Errors have occurred in the preparation, administration and monitoring of IV phenytoin. Check the dose and the infusion rate carefully. Infuse undiluted if possible. Use only sodium chloride 0.9% and do not mix in the same line with other drugs. Extravasation may cause necrosis. Monitor the injection site closely.[1]
pH	12[1]
PREPARATION	Not required
STABILITY	Ampoule: store below 25 °C. Protect from light.[1] If the ampoule is refrigerated or frozen a precipitate may form but will dissolve at room temperature and can still be used.[1,3] A faint yellow colour may develop but does not affect potency.[3] Infusion solution: use immediately after dilution.[4]
ADMINISTRATION	
IM injection	Not recommended, slow and erratic absorption and risk of tissue necrosis.[1]
SUBCUT injection	Not recommended, risk of local tissue damage.[3]
IV injection	Inject slowly into a large vein at a maximum rate of 50 mg/minute in adults. Faster rates cause serious cardiovascular events. i.e. a 300 mg dose must be injected over at least 6 minutes or a 1 g dose must be injected over at least 20 minutes. Use a syringe pump if possible. Flush well with sodium chloride 0.9% to reduce venous irritation.[1] Check your local guidelines. See SPECIAL NOTES
IV infusion	Phenytoin is poorly soluble and may precipitate when diluted.[1] Preferably, infuse undiluted using a syringe pump. Do not give faster than 50 mg/minute in adults or 25 mg/minute in elderly patients. Faster rates cause serious cardiovascular events.[1] Alternatively, dilute the dose with sodium chloride 0.9% to a concentration of 3–10 mg/mL and infuse over 30 to 60 minutes.[4,5] E.g. dilute 300 mg in 100 mL of sodium chloride 0.9% to make a concentration of 3 mg/mL or dilute 1 g in 250 mL to make a concentration of 4 mg/mL. Inspect the solution for particles and only use solutions that are clear and do not contain particles. Use a 0.2–0.5 micrometre inline filter if possible. Flush the line with sodium chloride 0.9% before and after the infusion.[1]
	Options for preparing an infusion: Infuse undiluted using a syringe pump (preferred), dilute 300 mg in 100 mL of sodium chloride 0.9%, or dilute 1 g in 250 mL of sodium chloride 0.9%.
IV use for infants and children	For IV infusion prepare as above. Infuse at a rate of 1–3 mg/kg/minute with a maximum rate of 50 mg/minute.[1,5,6] Use a 0.2–0.5 micrometre inline filter if possible. Flush with sodium chloride 0.9% before and after administration.[1]

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COMPATIBILITY

Fluids Sodium chloride 0.9% (for up to 2 hours)[4]

Y-site Do not mix with other drugs.

INCOMPATIBILITY

Fluids Glucose 5%[3], glucose 5% in sodium chloride 0.9%[3], Hartmann's[3], sodium chloride 0.45%[3]

Drugs There is an extensive list of incompatibilities.[7] Do not mix with other drugs.

SPECIAL NOTES

The rate of administration must not exceed 50 mg/minute. Administration at faster rates may result in cardiac arrhythmias, impaired cardiac conduction, hypotension, cardiovascular collapse or CNS depression.[1]

Severe complications are most often reported in elderly patients. Administer at a maximum rate of 25 mg/minute and if necessary at 5–10 mg/minute for elderly patients.[1]

Monitor heart rate and blood pressure and observe for respiratory depression.[1]

ECG monitoring is recommended[1], but may not be necessary in all settings.[8] Check your local guidelines.

May cause irritation, inflammation and pain at the injection site with or without extravasation.[1] Purple glove syndrome can occur after IV phenytoin.[9]

Phenytoin is poorly soluble; a drop in pH will cause precipitation. Flush the line well before and after administration. Blocked lines or catheters caused by the formation of phenytoin crystals may be cleared by local instillation of sodium bicarbonate 8.4%.[10]

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