

PhenyTOIN

Classification

 **HIGH ALERT MEDICATION**

Anticonvulsant

Indications

■ CCP: Seizures refractory to midazolam

Contraindications

- Sinus bradycardia, sinoatrial block, 2nd or 3rd degree AV block, Adams-Stokes syndrome, QT interval prolongation, or other heart rhythm disorders
- Hypersensitivity to phenytoin or other hydantoins
- Hypersensitivity to propylene glycol or ethanol
- Concurrent poisoning or toxic ingestion (cyclic antidepressants, cocaine, etc.)

Adult dosages

■ CCP: Seizures refractory to midazolam

- 20 mg/kg IV/IO -- dilute to a concentration of 10 mg/mL or less, and infuse based on body weight:
 - For patients < 75 kg: administer over a minimum of 30 minutes
 - For patients 76-150 kg: administer over a minimum of 60 minutes
 - For patients > 151 kg: administer over a minimum of 90 minutes
- Do not repeat administration

Pediatric Considerations And Dosing

■ CCP: Seizures refractory to midazolam

- 20 mg/kg IV/IO over a minimum of 30 minutes. Dilute to a concentration of 5 mg/mL.
- Do not repeat administration

Mechanism Of Action

Stabilizes neuronal membranes and decreases seizure activity by lowering intracellular sodium levels in the motor cortex; prolongs effective refractory period and suppresses ventricular pacemaker automaticity, shortening action potential in the heart.

Pharmacokinetics

Following intravenous administration:

- Onset: 30 minutes - 1 hour
- Half-life: 10-12 hours (NB: half-life is not first-order, and increases with increasing phenytoin concentrations)
- Excretion: urine

Adverse Effects

Cardiovascular: Cardiac arrhythmia, cardiac conduction disturbance (depression), circulatory shock, hypotension, ventricular fibrillation

Central nervous system: Ataxia, cerebral atrophy (elevated serum levels and/or long-term use), cerebral dysfunction (elevated serum levels and/or long-term use), confusion, dizziness, drowsiness, headache, insomnia, nervousness, paresthesia, peripheral neuropathy (associated with chronic treatment), slurred speech, suicidal ideation, suicidal tendencies, twitching, vertigo

Dermatologic: Bullous dermatitis, exfoliative dermatitis, morbilliform rash, scarlatiniform rash, skin or other tissue necrosis, skin rash

Endocrine & metabolic: Decreased T4, increased gamma-glutamyl transferase, vitamin D deficiency (associated with chronic treatment)

Gastrointestinal: Constipation, dysgeusia, gingival hyperplasia, nausea, swelling of lips, vomiting

Genitourinary: Peyronie's disease

Hematologic & oncologic: Macrocytosis, megaloblastic anemia, pseudolymphoma, purpuric dermatitis

Hepatic: Acute hepatic failure, hepatic injury, hepatitis, increased serum alkaline phosphatase, toxic hepatitis

Local: Injection site reaction ("purple glove syndrome;" edema, discoloration, and pain distal to injection site), local inflammation, local irritation, localized tenderness, local tissue necrosis

Neuromuscular & skeletal: Osteomalacia

Ophthalmic: Nystagmus

Miscellaneous: Fever, tissue sloughing

Warning And Precautions

HIGH ALERT MEDICATION

Phenytoin must be infused slowly. Do not exceed an infusion rate in adults of 50 mg/minute, and 1-3 mg/kg/minute (or 50 mg/minute, whichever is greater). Hypotension and severe cardiac arrhythmias may occur with rapid administration, and have been reported even when infused below recommended rate. Cardiovascular monitoring is mandatory during and after phenytoin administration.

Phenytoin is a vesicant and can cause significant tissue damage if extravasation occurs. Ensure line patency during infusion.

Ensure that an in-line micron filter is used during administration of diluted solution to prevent infusion of phenytoin crystals.

Phenytoin is **incompatible** with **dextrose solutions** and will precipitate very rapidly.

Do not attempt to administer phenytoin through PICC lines.

