Phenytoin (Dilantin)

Phenytoin (Dilantin) is a widely-used anticonvulsant medication that acts on the central nervous system without depressing the entire CNS. This medication is indicated for partial seizures and tonic-clonic seizures. Side effects of this drug include gingival hyperplasia, sedation, ataxia, nystagmus, rash, purple glove syndrome, anemia, and hirsutism. Since Phenytoin has a narrow therapeutic range and dosing is highly individualized, the patient should strictly adhere to the prescribed dosage and avoid abrupt withdrawal.



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Mechanism

Blocks Na+ Channels
Blocking Salt-shaker Channel
Phenytoin blocks sodium channels by preventing sodium from entering certain neurons. More specifically, it increases sodium channel inactivation, decreasing the flux of sodium ions across the neuronal membrane. This action suppresses action potentials and decreases seizure activity caused by hyperactive neurons. This drug targets hyperactive seizure-inducing neurons and does not affect normal neurons.

Indications

Tonic-clonic Seizures
Tonic-clown Caesar
This medication prolongs the inactivation of sodium channels and decreases high-frequency neuronal firing associated with tonic-clonic seizures. This results in decreased seizure activity.

Side Effects

Ataxia
A-taxi
Excessive dosage of phenytoin may result in ataxia, a staggering gait caused by uncoordinated muscle movement.

Nystagmus
Nastradamus
Excessive dosage of phenytoin commonly results in nystagmus, a continuous and involuntary back-and-forth movement of the eyes. Patients may also complain of diplopia, or double vision.

Sedation
Sedation-dart
Although phenytoin does not depress the entire CNS, this drug still has the potential for sedative effects. High doses of this medication will increase the risk of sedation. Monitor the patient's level of consciousness.

Gingival Hyperplasia
Gums and Teeth Wind-up Toy
Phenytoin may cause gingival hyperplasia, excessive gum tissue growth that leads to swelling, tenderness, and bleeding. Instruct the patient to practice good oral hygiene techniques, such as frequent flossing and gum massage.

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Purple Glove Syndrome

Purple Gloves

Excessive intravenous dosage of phenytoin may result in purple glove syndrome (PGS), a rarely observed skin manifestation characterized by painful and discolored swollen hands and arms. Complications include compartment syndrome and may require amputation. Stop administration of phenytoin and the application of a warm compress may alleviate pain.

Hirsutism

Bearded-lady

Inform the patient (especially young females) taking phenytoin that hirsutism, the excessive growth of hair in unusual areas, may occur.

Rash

Rash

Phenytoin may cause a mild rash that may progress to Stevens-Johnson Syndrome (SJS) or toxic epidermal necrolysis (TEN) characterized by red lesions. Stop drug administration if the patient develops a rash.

Anemia

Anemone

This drug may cause bone marrow depression. The decrease production of red blood cells may lead to anemia. This drug also decreases bone mineral density and increases this risk of developing osteopenia. Prior to therapy, obtain a complete blood count (CBC) to establish baseline and periodically assess CBC.

Considerations

Individualized Dosing

Personalized Dosing-needle

Phenytoin dosing is highly individualized and requires frequent monitoring of therapeutic plasma drug levels. The patient should maintain a phenytoin level between 10-20 mcg/mL to experience effectiveness and avoid toxicity. After establishing a maintenance dose, the patient should strictly adhere to the prescribed dosage for optimal control of seizures. To discontinue phenytoin treatment, gradually taper down the dosage. Abrupt phenytoin withdrawal may cause seizure activity.

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