Drug Guideline Title: Phenytoin

Summary:

Approved by: ICU Medical Director

Publication (Issue) Date: February 2014

Next Review Date: February 2017

Replaces Existing Drug Guideline: Phenytoin

Previous Review Dates: 2002, 2004

1. Introduction contains:

The risk addressed by this policy:

Patient Safety

The Aims / Expected Outcome of this policy:

Phenytoin will be administered safely and without adverse side effects

Related Standards or Legislation

NSQHS Standard 1 Governance
National Standard 4 Medication Safety

Related Policies
- LH_PD2013_C03.01 Drug Administration
- LH_PD2010_C03.00 Drug Prescribing
- LH_PD2008_C03.12 Administration of IV Medication

2. Policy Statement:

- All care provided within Liverpool Hospital will be in accordance with infection control, manual handling and minimisation and management of aggression guidelines.
- Medications are to be prescribed and signed by a medical officer/authorised nurse practitioner (NP) unless required during an emergency.
- All drugs administered during an emergency (under the direction of a medical officer/authorised nurse practitioner) are to be documented during the event, then prescribed and signed following the event.
- Medications are to be given at the time prescribed (as close to the time as is possible when multiple drugs require ‘same time’ administration and, when the nurse is caring for more than one patient, recognition is given to a possible short delay to administration – antibiotics and other lifesaving drugs are to be prioritised) and are to be signed by the administering nurse.
• Parenteral medication prescriptions and the drug are to be checked with a second registered or endorsed enrolled nurse prior to administration. The “rights of drug administration” must be followed: right: patient, drug, dose, route, administration, time, reason for the drug, documentation, education and evaluation/outcome.
• Adverse drug reactions are to be documented and reported to a medical officer.
• Medication errors are to be reported using the hospital electronic reporting system: IIMS.
• Guidelines are for adult patients unless otherwise stated.

3. Principles / Guidelines

Phenytoin is an anticonvulsant.

• It binds and blocks sodium influx, stabilising the neuronal threshold against excitability caused by excessive stimulation.
• Phenytoin inhibits the spread of seizure activity in the motor cortex.
• Other mechanisms possibly contributing to its anticonvulsant properties are:

⇒ inhibition of neuronal calcium influx.
⇒ enhancement of GABA neurotransmission.
⇒ blocks inotropic receptors for glutamate (a transmitter implicated in seizure activity).

• An antiarrhythmic action may be due to the normalisation of influx of sodium and calcium to cardiac purkinje fibres.
• There is a shortened refractory period and shortened QT interval.

Indications

• Seizure prophylaxis or control.
• Management of cardiac dysrhythmias refractory to conventional agents or cardioversion.
• Epilepsy, including simple and complex partial seizure, and generalized tonic clonic seizures.
• Status epilepticus.

Contraindications

• Hypersensitivity, hydantoin sensitivity.
• Sinus bradycardia, 2nd & 3rd degree A-V block.
• Rapid IV administration.

Precautions

• In patients with renal and hepatic impairment, excretion and protein binding of phenytoin may be altered and dose adjustment may be necessary.
• Diabetes, as hyperglycemia may be potentiated.
• Use with caution in patients with hypotension and severe myocardial insufficiency.
• Porphyria - There have been reports linking phenytoin to exacerbation of this disease.
• Phenytoin can cause rare, serious skin adverse events such as exfoliative dermatitis, SJS, and TEN, which can be fatal. Although serious skin reactions may occur without warning, patients should be alert for the signs and symptoms of skin rash and blisters, fever, or other signs of hypersensitivity.
• Phenytoin exhibits zero-order elimination kinetics therefore dose adjustment should be cautious for toxicity.

Significant Interactions

• Drugs, which increase phenytoin levels, include amiodarone, erythromycin, ranitidine, nifedipine, metronidazole, isoniazid and omeprazole,
Phenytoin

Drugs, which decrease phenytoin levels, include ciprofloxacin, sucralfate and theophylline.
Nasogastric feeds are associated with decreased absorption of oral phenytoin.

Adverse Effects

- The most notable signs of toxicity are cardiovascular collapse and/or central nervous system (CNS) depression.
- Nystagmus
- Confusion, ataxia, dizziness.
- Nausea and vomiting.
- Tissue necrosis if extravasation occurs.
- Contact dermatitis.
- Gingival hypertrophy.
- Dysrhythmias.
- Rash, discontinue immediately
- Hyperglycaemia.
- Hirsutism, lymphadenopathy, paradoxical seizure, peripheral neuropathy

Presentation

Phenytoin 100mg in 2mL ampoule.
Phenytoin 250mg in 5mL ampoule.

Administration Guidelines

Loading dose:
- Loading dose of 10 – 15mg/kg phenytoin by IV infusion.
- Generally, administered as 1g phenytoin diluted in 100mL sterile 0.9% sodium chloride over 30 minutes to 1 hour.
- Do not administer as a rapid IV infusion, as severe hypotension and bradycardia may occur.
- Observe peripheral IV site for signs of phlebitis, preferable to administer via central venous access device.

Maintenance dose:
- Administer 300mg phenytoin (IV), diluted in 100mL sterile 0.9% sodium chloride over 30 minutes, daily.
- Ongoing therapy should preferably be via a central venous access device.
- Initially, therapeutic levels are checked daily and the dose adjusted to maintain a level of 40 to 80 µmol/L.
- Ensure prescription specifies either oral/enteral or IV administration as oral/enteral absorption differs to intravenous absorption.

Phenytoin is only administered with sterile 0.9% sodium chloride diluent in a separate burette and giving set. The mixing of phenytoin sodium with other drugs or with intravenous infusion solutions is not recommended because the solubility of phenytoin sodium is such that crystallisation or precipitation may result.

Clinical Considerations

- Wash hands if contact is made with the medication to prevent contact dermatitis.
- Therapeutic levels of phenytoin are 40-80 umol/Litre.
• Trough levels provide information about the clinically effective serum level range and confirm patient compliance, and are obtained just prior to the patient’s next scheduled dose.

4. Performance Measures
All incidents are documented using the hospital electronic reporting system: IIMS and managed appropriately by the NUM and staff as directed.

5. References / Links
1. MIMS Online, CIAP: NSW Health Department, Copyright MIMS Australia Pty Ltd. February 2012. http://www.use.hcn.com.au

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