Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

BACK TO KIOSK

Fosphenytoin/Phenytoin Intravenous Administration: Change of Practice

Introduction/Problem

- Fosphenytoin, a pro-drug of phenytoin, is produced as a water-soluble formulation and can be administered at a faster rate and exhibits less irritation on infusion than phenytoin. Previously, it was thought that fosphenytoin may incur fewer cardiac complications than phenytoin.
- Multiple case reports have recently demonstrated that there is a higher associated risk for cardiac events, specifically hypotension, arrhythmia, and bradycardia, with fosphenytoin administration than was previously assumed.
- The manufacturers of both medications currently recommend cardiovascular monitoring and slower infusion rates, not exceeding a maximum dose on infusion.
- Given a recent review of fosphenytoin and phenytoin use at our institution, updates were necessary to provide guidance to nursing staff for determining infusion rates and monitoring.

Aim/Goal

To minimize the risk of cardiac side effects associated with high dose and fast infusion rates of fosphenytoin and phenytoin

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High Risk Patients

Patients that are at highest risk for bradycardia and hypotension while receiving fosphenytoin and phenytoin include:

- ICU patients
- Elderly patients (60 and older)
- Patients with SBP < 95 mm Hg, awake heart rate <55 bpm
- Patients with 2nd degree or higher atrio-ventricular block, LVEF <40%, and intravascular volume depletion

Intravenous Guideline Updates

Update #1 (Fosphenytoin and Phenytoin)

Fosphenytoin

Do not exceed infusion rate of 150mg PE per minute.

Fosphenytoin Infusion Rates by Indication:

- **Emergency Seizure Control:** Infuse loading dose over 10 minutes
- **Emergency seizure control in high risk patients for hypotension and bradyarrhythmia** : infuse the dose over 30 minutes
- **Non-emergent and maintenance doses:** infuse the dose over 20 minutes

Phenytoin

Do not exceed infusion rate of 50mg per minute.

Phenytoin Infusion Rates by Indication

- **Emergency seizure control:** Infuse loading dose over 30 minutes
- **Emergency seizure control in high risk patients for hypotension and bradyarrhythmia**: Infuse dose over 60 minutes
- **Non-emergent and maintenance doses:** Infuse dose over 30 minutes

For more information, contact:

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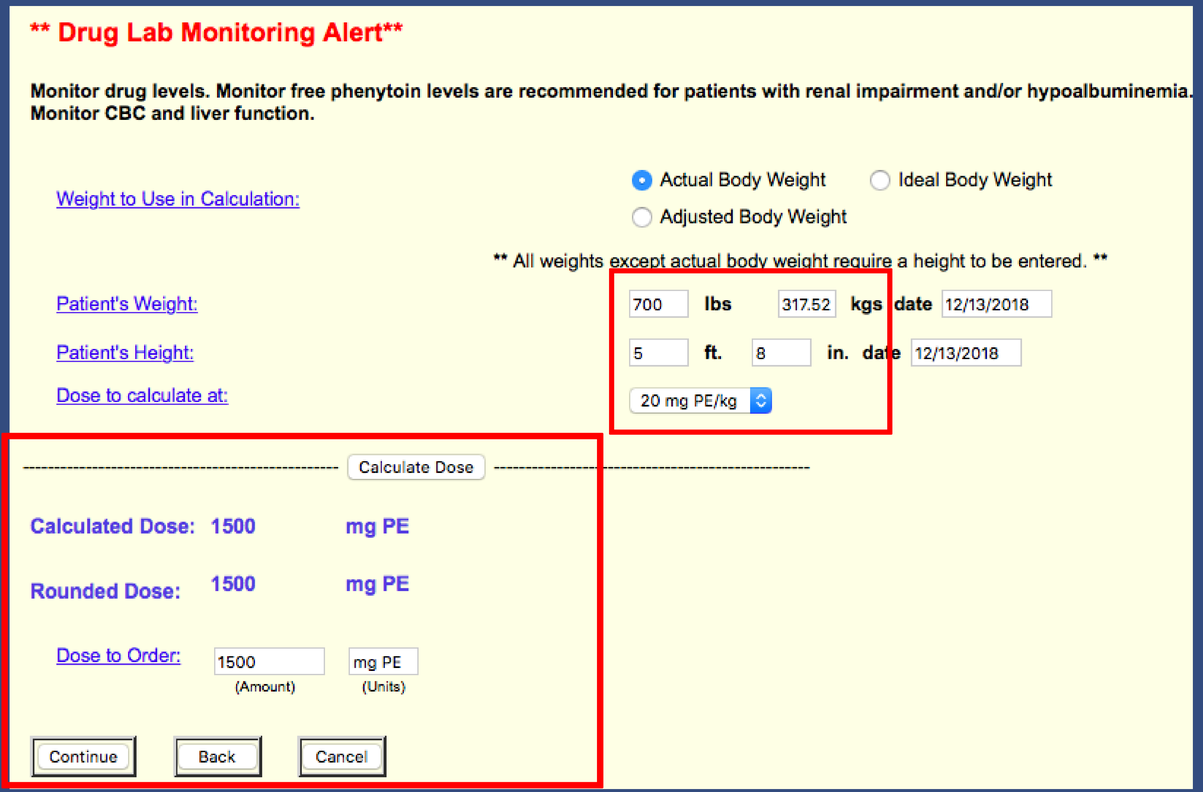
Intravenous Guideline Updates: What's New?

Update #2 (Fosphenytoin and Phenytoin)

Maximum loading dose is limited to 1500mg per single dose.



Update #3 (Fosphenytoin and Phenytoin)

Recommended monitoring: Cardiac telemetry blood pressure, heart rate and respiratory rate monitoring are essential at baseline, then continuously during loading dose infusion and for 1 hour following the infusion.

Update #4 (Fosphenytoin and Phenytoin)

Phenytoin vials were removed from all ICU Omnicell cabinets. The option of the IV push was removed from the IV guideline.

Lessons Learned

- Fosphenytoin and phenytoin have an associated risk of hypotension and bradycardia at high doses given at accelerated rate.
- Loading doses higher than 1500mg per single dose are not recommended.
- Administration of both medications require close monitoring.

Next Steps

Aforementioned changes were made in the IV guidelines available on PPGD and via the electronic medical administration record (eMAR). The next phase of the project is to make indication-based selection of both medications in the provider order entry.

For more information, contact:

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