



Pharmacy Friday

Brief pearls related to acute care pharmacology and evidence-based medicine

Other pearls can be found at:

- <https://sites.google.com/presby.edu/pharmacy-friday>



Push Dose Vasopressors

Patient Case

- The team gets a call that there is a 75 year old male that triggered a sepsis alert in route with EMS and is currently desaturating on 15 L of oxygen with decision made to intubate this patient
- Prior to intubation, the patient hasn't responded to a NS bolus infusion these are the patient's vitals:



- Knowing that pre-intubation hypotension has been associated with peri-intubation cardiac arrest, which agent do you order? If it is not commercially available, how do you make it?

Pharmacology

	Phenylephrine (PE)	Epinephrine (EPI)
Properties	A ₁ ++++ ↑ BP B ₁ ± ↔HR B ₂ ±	A ₁ +++ ↑ BP B ₁ +++++ ↑ HR B ₂ +++++
Dose	100-200 mcg PRN Q 1-5 minute	10- 20 mcg PRN Q 1-5 minute
Formulation	Premixed Syringe- 1000 mcg/10 ml	Not commercially available
PK/PD	Onset: 1 minute Duration: ~10-20 minutes	Onset: 1 minute Duration: ~5-10 minutes
Adverse Effects	Reflex bradycardia Hypertension	Tachycardia Hypertension
Precautions	Bradycardia, heart block, heart failure, angina, acute MI	Tachycardia
Compatibility	Compatible with NS, LR, D5	Compatible with NS, LR, D5
Location in GHS	CPR, Trauma, Zone 2+3 Pyxis	1 mg/ml: CPR, Trauma, Zone 2+3 Pyxis
Comments	Administer through a large bore peripheral IV; Low extravasation risk	Administer through a large bore peripheral IV; Low extravasation risk

Making Epinephrine and Phenylephrine the “EASY WAY”

Supplies: 10 ml of NS, Insulin syringe, epinephrine or phenylephrine vial, tape, pen

Instructions:

- Take an insulin syringe and draw **up 0.1 ml of** epinephrine 1 mg/ml or phenylephrine 10 mg/ml, **dilute in 10 ml of NS**, label epinephrine 10 mcg/ml (100 mcg total) or phenylephrine 100 mcg/ml (1000 mcg total)

Making Epinephrine and Phenylephrine the Alternative Way

- Epinephrine
 - Draw up 9 mL of normal saline into a 10 mL syringe (DO NOT use 10ml IV line “flush” syringes)
 - Into this syringe, draw up 1 mL of **EPINEPHrine 0.1 mg/mL (1 mg/10ml) from a cardiac syringe**
 - **Label syringe epinephrine 10 mcg/ml**

- Phenylephrine
 - Draw up 1 mL of phenylephrine from a 10 mg/mL vial into a 3 mL syringe
 - **Inject this into a 100 mL bag of normal saline. Label bag; safely discard when finished**
 - Draw up 10 mL into a 10 mL syringe
 - Label syringe **phenylephrine 100 mcg/ml**

Overview of Evidence

Author, year	Design/ sample size	Intervention & Comparison	Outcome
Rotando, 2019	Observational ED/ICU N=146	PE 100 mcg/ mL or Ephedrine 50 mg/10 mL	Most common indication = peri-intubation hypotension Both agents associated with: ↑ SBP by 26 mmHg ↑ SBP by 26 mmHg ↓ HR by 6 beats per minute
Schwartz, 2016	Observational ED N=76	PE 100 mcg/ mL (pre-filled syringe)	46.5% patients were initiated on vasopressor drip ≤ 30 minutes; mean MAP ↑ from 56.5 to 79.3 mmHg most common dose 100 mcg most common indication = peri-intubation hypotension
Panchal, 2015	Observational ED N=119	PE 100 mcg/1 mL	PE given during the peri-intubation period: ↑ SBP by 20 mmHg, ↑ DBP by 10 mmHg, HR unchanged
Doherty, 2012	RCT OR N=60	PE IV push 120 mcg (pre-filled syringe) Vs PE infusion @ 120 mcg/min	The infusion used more drug (1740 v 964 mcg) Push dose pressor had favorable impact of MAP compared to infusion

1. **References** Micromedex [Electronic version]. Greenwood Village, CO: Truven Health Analytics. Retrieved March 18, 2019, from <http://www.micromedexsolutions.com/>
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3. Holden D. Ann Emerg Med. 2018 Jan;71(1):83-92.
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5. Rotando A. Am J Emerg Med. 2019 Mar;37(3):494-498.
6. Doherty A. Anesth Analg. 2012 Dec;115(6):1343-50.
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