

Title: Prehospital Push Dose Epinephrine

Report By: Matthew Dumaresque

2nd Party Appraiser: Jen Greene

Clinical Scenario: You respond to a corner store parking lot in a low income area of the city for a 50 year old female that collapsed while working as a crossing guard. On your arrival the patient is found laying on her side, she appears unwell, is pale, diaphoretic, and has weak peripheral pulses. The patient is scooped to your stretcher and placed in the ambulance. She has dynamic ECG changes and rapidly evolves into a STEMI which appears to be LMCA in origin. The patient is hypotensive in apparent cardiogenic shock, you obtain IV access and transmit the ECG to activate the Cath lab as your partner starts driving quickly towards the hospital. During your 4 minute transport time while being thrown around in the back of the ambulance you have to decide whether to start Dopamine using a Buretrol or push Epinephrine as a bolus to temporize hemodynamics to stabilize the patient, you wonder if this is in your scope and how safe it is.

PICO (Population – Intervention – Comparison – Outcome) Question: In prehospital shock patients, does push-dose Epinephrine manage hemodynamics effectively and safely?

Search Strategy: (push dose epinephrine OR push dose pressors OR bolus dose epinephrine) AND (Improve blood pressure OR improve MAP OR hemodynamics)

Search Outcome: 195 Results

AUTHOR, DATE	POPULATION	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/WEAKNESSES
Nawrocki, 2020	Shock patients transported by an American Critical Care Transport Service in Pittsburg, PA, USA. BP <90 systolic, MAP <65. Excluded: pregnant patients, prisoners, age 18 or less	Retrospective Observational Study	<ul style="list-style-type: none"> • Primary Diagnosis Associated • Hemodynamic Outcomes • Adverse Events 	<ul style="list-style-type: none"> • Post ROSC (43.9%), Sepsis (15.8%), Altered Mental Status (14.0%) • Mean MAP Increase of 13.0 (5.0-34.0mmHg) Mean Increase in HR 2.0 (-1.0-9.3) • Hypotension Resolved in 58.5% • 1 episode of transient extreme hypertension with no patient harm • 3 patients experienced cardiac arrest within several minutes of PDE • Single case of 30mcg admin, no other medication or dosing errors 	<p>Strength: Critical Care Transport Patients</p> <p>Weaknesses: Small Study with missing results for 14 patients of 52</p>

AUTHOR, DATE	POPULATION	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/WEAKNESSES
Guyette, 2019	Patients transported by a single large critical care transport network from January 2011 to January 2017. Included adult patients greater than or equal to 14 years of age with profound hypotension. Any patient with at least one documented SBP <70mmHg.	Retrospective case-cohort study	<p>24-hour survival, survival to hospital discharge, and 30-day survival</p> <p>Abnormal vital signs within 10 minutes of the index event (persistent hypotension <70 mmHg, severe hypertension >220 mmHg), tachydysrhythmia, need for cardiopulmonary resuscitation; and new post-treatment infusion vasopressor administration.</p>	<ul style="list-style-type: none"> • 24-hour survival for the Bolus dose epinephrine (BDE)-treated group was significantly lower (65% vs. 82%) • Survival to hospital discharge was lower in the BDE-treated patients (43% vs. 60%, however not significant after adjustment P=0.05) • 30-day survival was lower in the BDE-treated patients (38% vs. 56%) • In the 10 minutes after the index hypotensive event, mean BP was significantly higher among BDE-treated patients than controls (99 mmHg vs. 89 mmHg, P <0.001) • A significantly higher proportion of BDE-treated patients had recurrent hypotension (68% vs. 50%) • 1% of the BDE-treated patients had an episode of SBP>220 compared to 0% of the control group. 	<p>Strengths: Large cohort, large amount of data points with little to no missing data, CCT patients, control group, adjusted values by several means (Likert scale, Wilcoxon rank-sum test).</p> <p>Weaknesses: The control group was prior to BDE protocol being in place so other treatments would have been started sooner (pressor infusions), the patients who received the BDE treatment were sicker (started with a mean systolic BP of 74.8 vs. 100, GCS 3 vs. 8)</p>

Comments: The Nawrocki study administered Epinephrine 10-20mcg IVP where Guyette was Epinephrine 100mcg IVP with fluids running wide open.

Consider: I would not change current practice and continue to administer push dose epinephrine in the critical care environment. Further studies, (possibly RCTs) would need to be performed to see if this translates to the ACP ground scope of practice.

Clinical Bottom Line: Push dose Epinephrine effectively raises blood pressure, stabilizing hemodynamics and is safe at lower doses (10-20mcg) when used by out of hospital critical care clinicians.

References:

Nawrocki PS, Poremba M, Lawner BJ. Push Dose Epinephrine Use in the Management of Hypotension During Critical Care Transport. *Prehosp Emerg Care*. 2020 Mar-Apr;24(2):188-195. doi: 10.1080/10903127.2019.1588443. Epub 2019 Mar 28. PMID: 30808241.

Guyette FX, Martin-Gill C, Galli G, McQuaid N, Elmer J. Bolus Dose Epinephrine Improves Blood Pressure but is Associated with Increased Mortality in Critical Care Transport. *Prehosp Emerg Care*. 2019 Nov-Dec;23(6):764-771. doi: 10.1080/10903127.2019.1593564. Epub 2019 Apr 9. PMID: 30874471.