

# Paramedic - Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** *Norepinephrine vs Dopamine in Shock*

**Report By:** *Calvin Luck*

**2<sup>nd</sup> Party Appraiser:** *Jennifer Greene*

### **Clinical Scenario:**

*"You are responding to a call for a "sick person". You arrive to a patient who is disoriented, lethargic, tachypneic, tachycardic, and hypotensive. He/she is four days post-op for a bowel resection. You strongly suspect sepsis. On route to hospital, you administer 2 liters of normal saline but there is no change in blood pressure or patient status. You immediately start to set up for a pressor infusion. You reach for the pressor and discover that you have two choices: Norepinephrine or Dopamine. Which will you choose?"*

### **PICO (Population – Intervention – Comparison – Outcome) Question:**

*In shocks patients of all origins, which vasopressor, norepinephrine or dopamine, is associated with better mortality rates?*

**Search Strategy:** *((prehospital OR out of hospital)) AND (shock OR hypotension)) AND (Dopamine OR norepinephrine OR levophed).*

**Search Outcome:** *74 results*



# Paramedic - Evidence Based Medicine (P-EBP) Program

## Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Patel P. 2009	252 adult patients in septic shock	Randomized control trial  LOE - 1	28-day mortality  Occurrence of Adverse events	28-day mortality rate was 50% (67/134) with dopamine compared to 43% (51/118) with norepinephrine (P = 0.282)  Incidence of sinus tachycardia with dopamine was (24.6%; 33/134) compared to (5.9%; 7/118) with norepinephrine (P = < 0.0001)  Incidence of arrhythmias noted with dopamine were 19.4% (26/134) compared to 3.4% (4/118) with norepinephrine (P = < 0.0001)	Not an EMS study  Good randomization  Small sample size  Single center  28 day mortality included all causes (not necessarily linked to initial cause of shock or related to efficacy of pressor)  vasopressin and phenylephrine were added to treatment regimen in some instances (vasopressors being evaluated were not always isolated)



# Paramedic - Evidence Based Medicine (P-EBP) Program

De Backer D. 2010	1679 adult patients who required vasopressor treatment (MAP below 70 mm Hg or systolic BP below 100 mm Hg)	Randomized control trial  LOE - 1	28-day mortality  Occurrence of Adverse events	28-day mortality rate was 52.5% with dopamine compared to 48.5% with norepinephrine (P = 0.10)  28-day mortality was markedly increased in patients treated with dopamine in cardiogenic shock (percentage/number of patients not specified in study)  Incidence of arrhythmias noted with dopamine were 24.1% compared to 12.4% with norepinephrine (P = < 0.0001)	Not an EMS Study  Included shock of all origins  Double Blind  Multicenter
-------------------	--	---	--	---	--

**Comments:**

Search results included many irrelevant studies. The majority of studies evaluating different vasopressors were specific to patients in septic shock, and did not include shock of other origins.

**Consider:**

The significance of the difference in 28-day mortality rate between norepinephrine and dopamine is arguable.



# *Paramedic - Evidence Based Medicine (P-EBP) Program*

## **Clinical Bottom Line:**

*Norepinephrine is associated with marginally improved mortality rates in shock patients when compared to dopamine, but markedly improved mortality rates in cases of cardiogenic shock, and it is associated with significantly fewer adverse events. The bottom line is that norepinephrine is superior in both its efficacy, and its safety.*

## **References:**

*Gourang P. Patel, Jaime Simon Grahe, Mathew Sperry, Sunit Singla, Ellen Elpern, Omar Lateef, Robert A. Balk. (2009). Efficacy and Safety of Dopamine versus Norepinephrine in the Management of Septic Shock. SHOCK, Vol. 33, No. 4, pp. 375-380*

*Daniel De Backer, M.D., Ph.D., Patrick Biston, M.D., Jacques Devriendt, M.D., Christian Madl, M. D., Didier Chochrad, M.D., Cesar Aldecoa, M.D., Alexandre Brasseur, M.D., Pierre Defrance, M.D., Philippe Gottignies, M.D., Jean-Louis Vincent, M.D., Ph.D. (2010) Comparison of Dopamine and Norepinephrine in the Treatment of Shock, The New England Journal of Medicine, Vol. 362 No.9*

