

# Appropriate Use of Vasopressin Following Education to Healthcare Workers

Oklahoma State University Medical Center and Center for Health Sciences | Pharmacy and Therapeutics Committee

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## INTRODUCTION

- Vasopressin is utilized in the intensive care unit, primarily for vasodilatory shock after adequate fluid resuscitation and norepinephrine [3,4]
- Low-dose vasopressin (0.04 units/minute) is preferred for both effectiveness and reduction in adverse effects [2]
- Vasopressin performs vasoconstriction without using the catecholamine pathway, utilizing a different physiological pathway to treat shock [2]
- Vasopressin is also used off-label for gastrointestinal variceal hemorrhage; dosed at 0.2-0.4 units/min continuous IV infusion, with max rate of 0.8 units/min and consideration of IV nitroglycerin to minimize ischemic complications [1, 2, 5]
- Last year a pilot study assessed the appropriate use of vasopressin at Oklahoma State University Medical Center and found that **49.7% of vasopressin orders were incorrect/errors**
  - Specifically, the study found that about **37% of vasopressin orders had inappropriate dosing or indication**
- The follow up proposed from that study was to provide education to key medical teams on dosing, indication, and titration of vasopressin

## AIM STATEMENT

- The goal of this quality improvement project is to assess the impact of a physician-led lecture to multiple medical teams at OSUMC on correct vasopressin use

## METHODS

- A lecture (intervention) covering appropriate indications, dosing and pharmacy workflow was given to the Internal Medicine (IM), Family Medicine (FM), and General Surgery (GS) teams at OSUMC in July 2022
- OSU Medical Center's EMR, EPIC®, was used to identify patients from February 1, 2021 to January 31, 2022 who received vasopressin during their hospitalization: 6 months before intervention and 6 months after intervention
- De-identified medical charts were reviewed for vasopressin use, including dosage, indication for use, and other relevant clinical data
- Results were analyzed and summarized for how vasopressin was prescribed and administered after an educational intervention was made

## RESULTS

Dosed Appropriately*	Number of Encounters		Percentage Change
	Pre-Int. (%) N = 103	Post-Int. (%) N = 102	
Yes	87 (84.5)	102 (100)	<b>+15.5%</b>
No	16 (15.5)	0 (0)	

\* Dose was considered appropriate if the encounter had an indication for either (1) shock at a dose of 0.04 units/min or (2) gastrointestinal bleed with a dose between 0.4-0.8 u/min

0.05 units x2	5 units x2
0.5 units x3	20 units x2
1 unit x4	100 units x1
2 units x3	

Appropriate Vasopressin Documentation	Number of Encounters		Percentage Change
	Pre-Int. (%) N = 103	Post-Int. (%) N = 102	
Appropriate	69 (67)	79 (77.5)	<b>+10.5% overall increase</b>
Inappropriate	34 (33)	23 (22.5)	

## INTERVENTION LECTURE OBJECTIVES

- Distinguish between appropriate and inappropriate documentation of vasopressin including indication and dose.
- Prescribe medications for shock and GI hemorrhage in guidelines recommended order.
- Understand the logistics and financial responsibility of ordering high-cost medications



Indication	Number of Encounters		Percentage Change
	Pre-Int. (%) N = 103	Post-Int. (%) N = 102	
Shock	61 (59.2)	73 (71.6)	<b>+11.2% overall increase</b>
GI bleeding	9 (9)	8 (7.8)	
Others:			n/a
Hypotension	15 (14)	17 (16.7)	
Cardiac Arrest	1 (1)	7 (6.9)	
Uterine Bleeding	2 (1.9)	0 (0)	

\*GIB = gastrointestinal bleeding

Agent Order	Number of Encounters		Percentage Change
	Pre-Int. (%) N = 82	Post-Int. (%)	
First (no other vasopressors)	13 (15.8)	1 (1.1)	<b>-14.7%</b>
First (with other vasopressors)	5 (6.1)	4 (4.2)	<b>-1.9%</b>
Second	45 (54.9)	44 (45.8)	-9.1%
Third	15 (18.3)	44 (45.8)	+27.5%
Fourth	4 (4.9)	3 (3.1)	-18%

\*First (with other vasopressors) indicates that vasopressin was initiated simultaneously with other vasopressors.

## REFERENCES

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## DISCUSSION

- Vasopressin is consistently among the top budget medications for the pharmacy, making vasopressin usage and documentation important
- Vasopressin usage during the pre and post-intervention analysis stayed the same, 103 and 102, respectively
- One reason we may continue to see the same amount of vasopressin prescribed (Table 1) was the **COVID-19 delta surge**, which may **inflate the amount vasopressin was prescribed after the intervention** – no COVID-19 wave was observed in the pre-intervention analysis
- Table 1 shows the overall **improvement** in correctly dosing vasopressin greater than 15%, this is largely driven by the fact that zero doses administered in the post-intervention were incorrectly dosed
- This shows that the intervention made to the primary teams (IM/FM/GS) lead to **vasopressin being dosed correctly 100% of the time**
- Table shows the impact of overall documentation of vasopressin also improved, as seen with a 10.5% increase in appropriateness of documentation
- This area still has area for improvement as over, post-intervention documentation was still inappropriate 22.5% of the time
- Table 3 highlights more specific documentation to identify areas for improvement with vasopressin
- Despite some increases in other dosing indications, the overall trend of appropriately documenting the use of vasopressin improved after the intervention
- Table 3 identifies key examples to be able to further education physicians in future educational seminars over correctly utilizing and documenting vasopressin
- Table 4 displays a decrease of over 16% (14.7% + 1.9%) of vasopressin being used as a first line agent in shock
- Current guidelines recommend norepinephrine as first-line for shock, then followed by other vasopressors including vasopressin
- Several factors influence the order of vasopressors that are added to shock patients including heart rate and catecholamine stores
- We recommend that educational seminars continue for primary teams managing vasopressin as we saw such great improvement after only one educational seminar to continue to improve vasopressin use and documentation**