Residual Infusion Performance Evaluation (RIPE): A Single-Center Evaluation of Residual Volume Post-Intravenous Eravacycline Infusion

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Background

- Infusion Nursing Society (INS) Standard of Practice notes there is a significant potential medication loss (up to 35%) with 50- and 100-mL solutions due to residual volume in the administration set[1]
- Institute for Safe Medication Practices (ISMP) recommends using microbore tubing and flushing the tubing after drug administration to minimize residual volume
- Overfill volume varies depending on manufacturer and bag size
  - 250 mL normal saline will have between 15-35 mL of overfill[2]
  - Overfill can be inconsistent even from the same manufacturer
- Data about residual volume for infusion volumes more than 100 mL is absent in published literature

Purpose

- Compare residual antibiotic volume remaining in bag following intravenous (IV) infusion of eravacycline before and after implementation of interventions

Methods

Patients receiving IV eravacycline at Methodist University Hospital	
Study Design	Quasi-experimental, descriptive, single-center
Study Period	Pre-intervention: July 1 – 31, 2021 Intervention: August 1 – October 31, 2021 Post-intervention: November 1 – 30, 2021
Inclusion Criteria	• ≥18 years of age • Received at least one dose of IV eravacycline
Exclusion Criteria	• Active COVID-19 infection • Pregnancy
Facility Practices	• 297 cm standard bore tubing, holding up to 20 mL • Simple admixture[$]

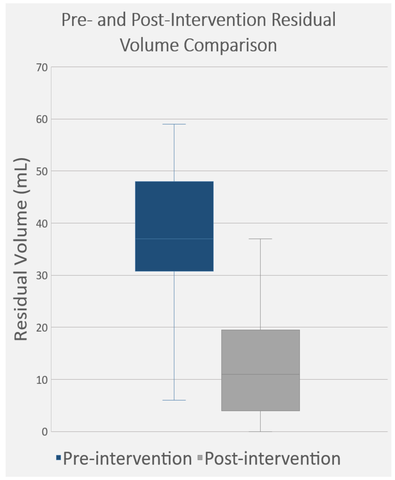
[$] Drug added to diluent bag without concern for overfill

Demographics

Characteristic	N = 16
Mean Age ± SD (range), years	58.1 ± 15.8 (27-86)
Male, n (%)	11 (68.8)
Race	
African American, n (%)	12 (75)
White, n (%)	3 (18.8)
Other, n (%)	1 (6.3)
Mean Weight ± SD, kg	87.9 ± 30.0
Mean Serum Creatinine at Time of Drug Initiation ± SD, mg/dL	1.8 ± 1.6

Results

A total of 46 doses (n=9) were evaluated in the pre-intervention population compared to 21 doses (n=7) post-intervention.



Drug (mg) Evaluation	Amount of Drug in Residual Volume (mg)		Average Amount of Drug in Residual Volume (mg) ± SD	p value
	Minimum	Maximum		
Pre-intervention (n = 46)	1.63	40.46	13.53 ± 7.49	<0.0001
Post-intervention (n = 21)	0	20.9	4.69 ± 5.14	

Results

A total of 46 doses (n=9) were evaluated in the pre-intervention population compared to 21 doses (n=7) post-intervention. The average amount of residual volume after a 250 mL infusion was 38.0 mL (~15% of total bag volume) for the pre-intervention group compared to 12.2 mL (<5% of total bag volume) for the post-intervention group (p<0.0001).

Volume Evaluation	Number of Doses		Average Volume Remaining (mL) ± SD	p value
	Day Shift	Night Shift		
Pre-intervention (n = 46)	22	24	38.04 ± 15.6	0.01
Post-intervention (n = 21)	11	10	12.2 ± 10.1	0.91
Total ± SD	33	34	25.14 ± 18.25	<0.0001

Conclusion

- Approximately 15% of each dose was not infused during the pre-intervention compared to less than 5% in the post-intervention period
- Residual volume reflected an average of 13.53 mg of eravacycline remaining after infusion in the pre-intervention period compared to an average of 4.69 mg remaining in the post-intervention period
- Interventions included nursing education, order comments, and addition of diluent volume to the total volume to be infused on label
- Cost of discarded drug during pre-intervention period was $893.45 compared to $161.04 in the post-intervention period
- Subsequent research is required to determine the extrapolation of these results to outpatient infusion centers or other facilities

References

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Disclosures

The authors of this presentation do not have any disclosures concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.