

# Flush It! Managing Antibiotic Residual Volume in Acute Care

## Background

30-60% of small-volume antibiotics are left in IV tubing when administered as a primary infusion (Alexander & Zomp, 2015)

Small-volumes should be administered as a secondary infusion to ensure residual volume is flushed (Harding, 2020)

There is variation in the process of administration of small-volume antibiotics and residual volume management.

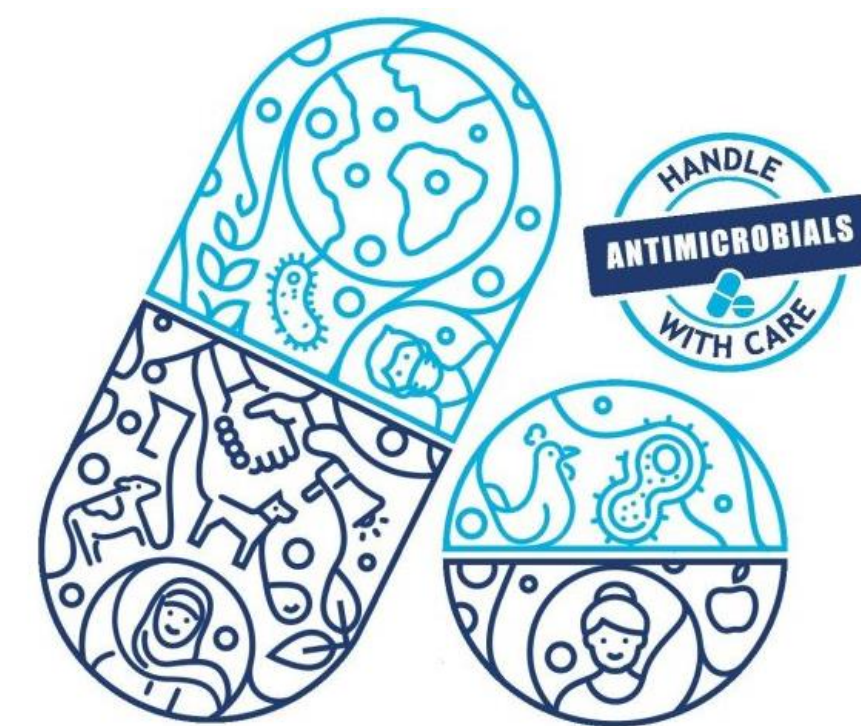
Reasons for variation include:

- Not all patients have continuous fluids ordered
- Ordered as IVPB (IV Piggyback) with no fluids ordered
- No standard or policy for residual volume management currently in place

## Importance of Issue

Residual volume of antibiotics left in IV tubing leads to:

- Incorrect dose of antibiotics (Bolla, et al., 2019)
- Incorrect duration of antibiotics (Peyko, 2021)
  - Decreased exposure to the minimum inhibitory concentration & reduced probability of target attainment
  - Possible treatment failure (Rout, 2019 and Peyko, 2021)
- Increased possibility of contamination for antibiotics requiring refrigeration (Harding, et al., 2020)
- Financial impacts associated with waste (Harding, et al., 2020) and potential increases in length of stay



(Zimmerman, 2022)

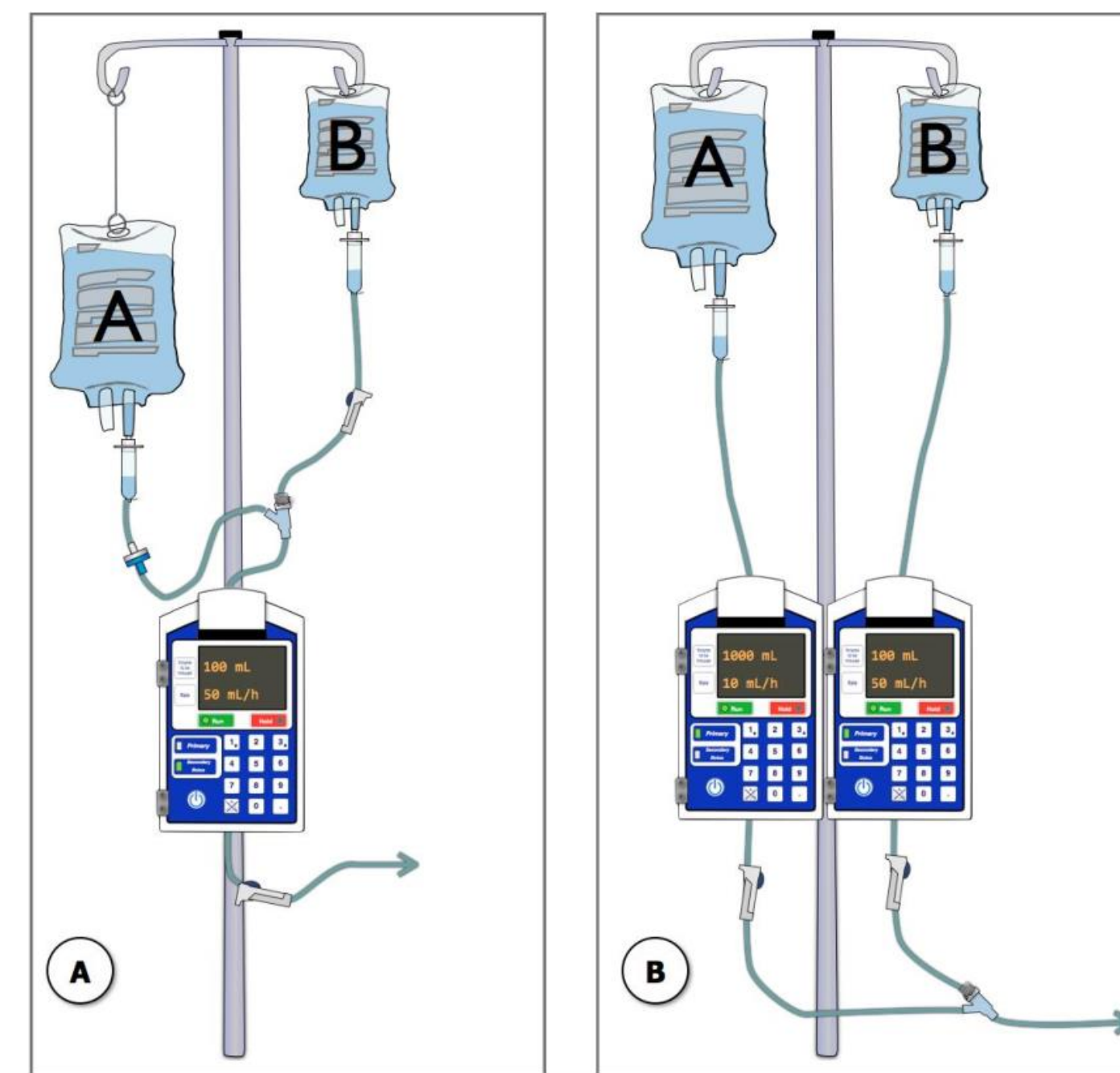
## Framework

Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals

This framework fosters interdisciplinary collaboration and teamwork to identify and implement evidence-based practices for the good of all patients.

## Key Concepts & Outcomes

Within 6 months of implementation, 95% of all small-volume antibiotics ordered and administered as intermittent secondary infusions, ensuring complete dose administration at the correct rate.



A) Secondary Infusion B) Primary Infusion(s) (Pinkney, et. al, 2014)

- Enhanced competency managing residual volume
- Decreased re-use of tubing for refrigerated medications
- For all patients receiving small-volume antibiotics:
  - Consistent, accurate doses
  - Consistent care for all populations

## Interventions & Solutions

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|---|---|--|
| <p><b>Nursing</b></p> <ul style="list-style-type: none"> <li>➤ Refresher education for RNs on correct set up of IV administration set with compatible fluid</li> <li>➤ Education on changes in policy</li> <li>➤ Disposal of all tubing containing antibiotics requiring refrigeration</li> </ul> | <p><b>Unit-Based</b></p> <ul style="list-style-type: none"> <li>➤ Selection of 2 champions per shift (day/night)</li> <li>➤ Education and unit specific feedback during unit huddles</li> </ul> | <p><b>Policy</b></p> <ul style="list-style-type: none"> <li>➤ Development of new order set to include compatible fluid for flushing</li> <li>➤ EHR changes:                             <ul style="list-style-type: none"> <li>- Prompt to scan ordered fluids with an antibiotic</li> <li>- Flowsheet row for documenting flush as part of intake/output</li> </ul> </li> <li>➤ Pharmacy verifies fluid is ordered</li> </ul> |
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## Key Players

- Registered nurses providing direct patient care
- Clinical education
- Acute care pharmacists
- Providers placing antibiotic orders
- Infectious disease providers
- Electronic health record (EHR) analysts/ developers and clinical informatics
- Nurse/hospital management and administrators
- Patients requiring IV antibiotics in acute care

## Evaluation

Process Evaluation	
Procedure Audit	Competent set up of IV administration set
Chart Audit	- Measure percentage of antibiotics ordered correctly with compatible fluid - Measure percentage of antibiotics scanned with compatible fluid for flushing

Impact Evaluation	
KAP Survey	Complete knowledge, attitude and practice survey pre and post implementation
Chart Review	Retrospective – comparing length of stay pre and post implementation
Chart Audit	Determine volume of flushed solution administered to ensure ongoing safety

## References

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