Poster #184

Targeting Medication Waste: Assessment of Economic Impact in Two Inpatient Institutions in Southern California

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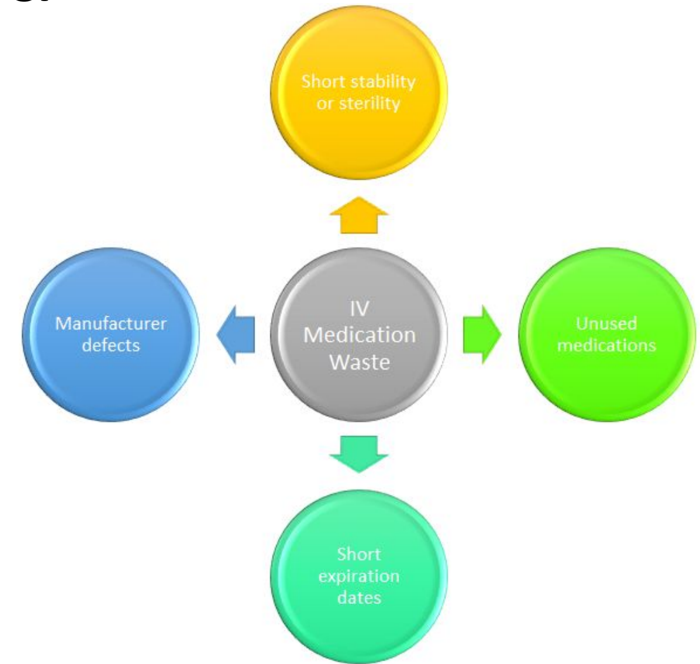
Background

- National Academy of Medicine estimated that the US Healthcare System wasted $765 billion/year on medication waste alone[2]
- Limited resources has the potential to affect:
  - Patient care
  - Environment
  - Health care costs
  - Many more!

2. Allen, M. (2017, December 28). Want to cut health-care costs? Start with the obscene amount of waste. The Washington Post. Retrieved February 22, 2020, from https://www.washingtonpost.com/news/posteverything/wp/ 2017/12/28/want-to-cut-health-care-costs-start-with-the-obscene-amount-of-waste/

Background

- Sterile compounding contributes to a large percentage of medication waste in inpatient pharmacies
- Assessing the impact of waste can support various pathways to waste minimization
  - Optimize resources
  - Formulary alternatives
  - Implement cost saving strategies



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2. Allen, M. (2017, December 28). Want to cut health-care costs? Start with the obscene amount of waste. The Washington Post. Retrieved February 22, 2020, from https://www.washingtonpost.com/news/posteverything/wp/ 2017/12/28/want-to-cut-health-care-costs-start-with-the-obscene-amount-of-waste/

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Study Objectives

- The focus of the project is set on the healthcare system on a spectrum that is not limited to the patient or provider, rather the process as a whole to decrease health care costs, waste, and mitigate drug shortages
  - **Primary outcome:** extrapolate the financial burden of waste on the pharmacy
  - **Secondary outcome:** quantify medication waste by category/unit, cost of wasted drugs, and identify census impact on waste

Study Design

Study Type:

- Observational, cross sectional, prospective study on medication waste

Data Collection Duration:

- October 11th 2019-November 11th 2019

Inclusion Criteria:

- Any patient specific IV medication compounded by the pharmacy

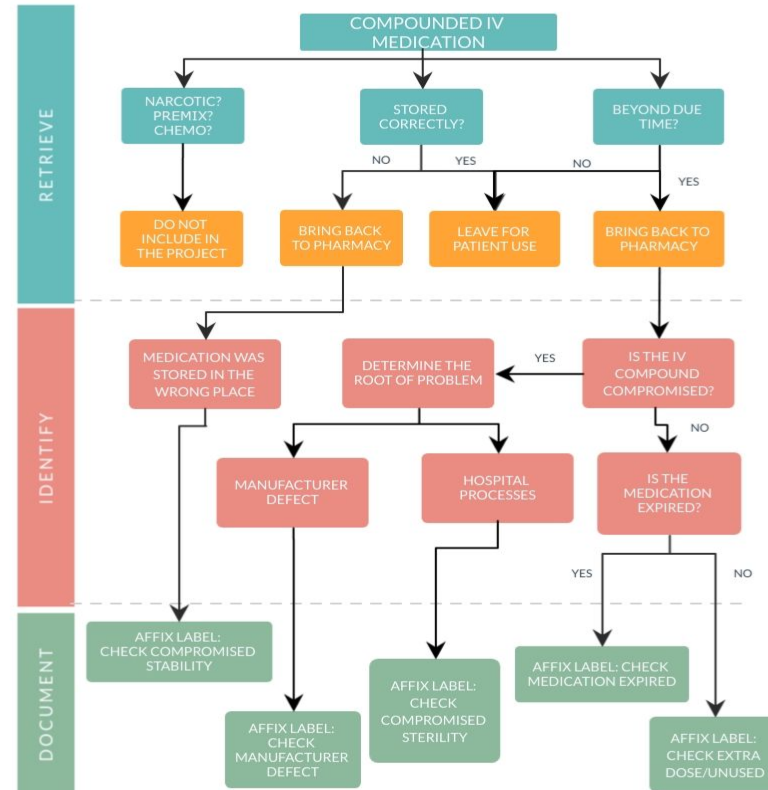
Exclusion Criteria:

- Narcotics, pre-mix formulations, chemotherapy

Methods

Data Collection:

- Pharmacy staff retrieved IV medications from the units that fall within the inclusion criteria
- Staff identified reason for waste of IV medications
- Medication labels were affixed to a log book
- Data was de-identified, extracted from labels, and input into Microsoft Excel



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Methods

- Investigators discerned waste patterns at two institutions (Hospital A and Hospital B) in the San Gabriel Valley
  - Data Measurements:
    - Raw data: date of collection, prepared/due times, medications (name/dose/diluent), reason for waste
    - Cost data: determined by average wholesale prices (AWP) using the Red Book
    - Percent waste: calculated using the total quantity of wasted bags as the denominator

Results

Hospital A

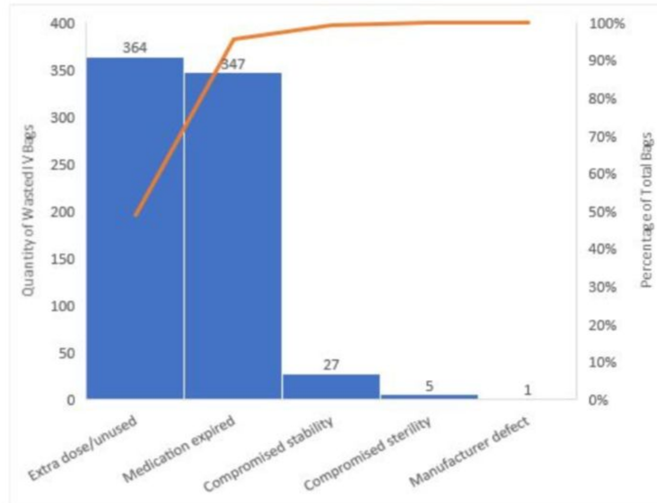

Figure 1A: Quantity of Waste by Category
Pareto chart of waste categories graphed by number of wasted IV bags and cumulative percentage at Hospital A.

Hospital B

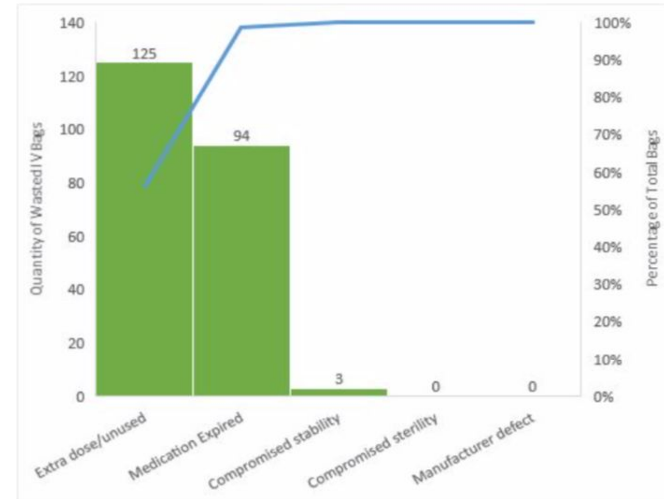

Figure 1B: Quantity of Waste by Category
Pareto chart of waste categories graphed by number of wasted IV bags and cumulative percentage at Hospital B.

Results

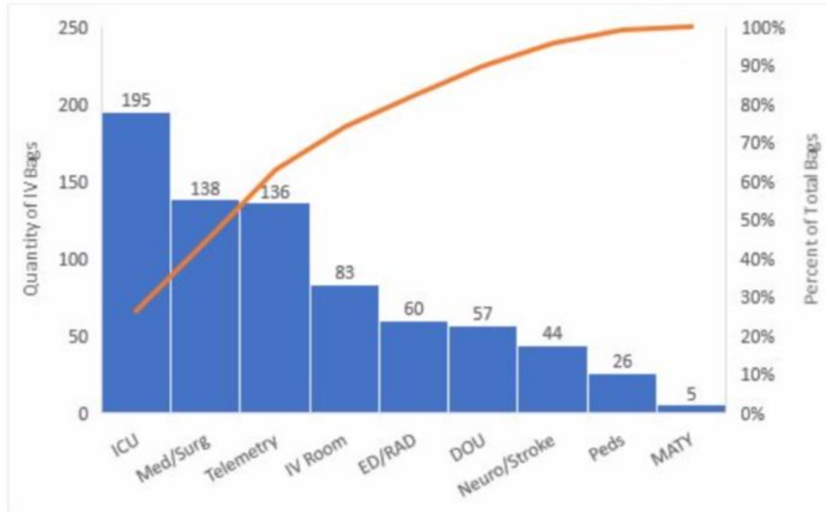

Figure 2A: Quantity of Waste by Unit
Pareto chart of waste categories graphed by number of wasted IV bags per unit and cumulative percentage at Hospital A.

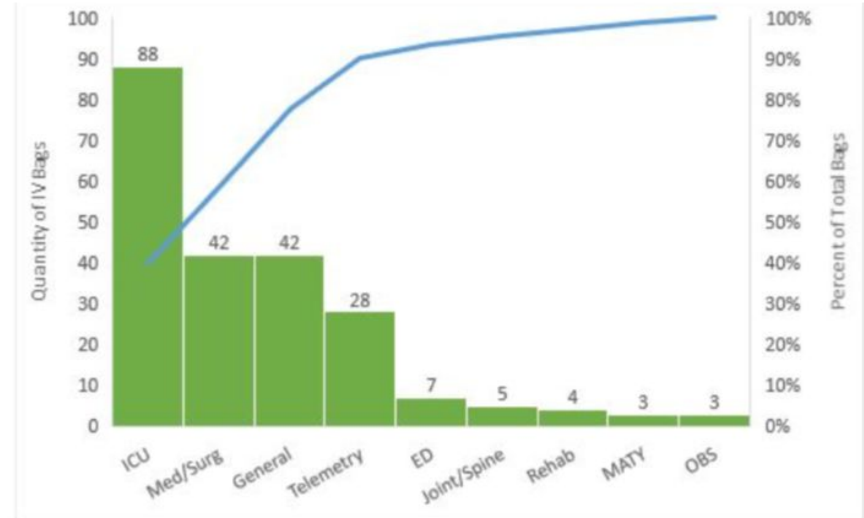

Figure 2B: Quantity of Waste by Unit
Pareto chart of waste categories graphed by number of wasted IV bags per unit and cumulative percentage at Hospital B.

Results

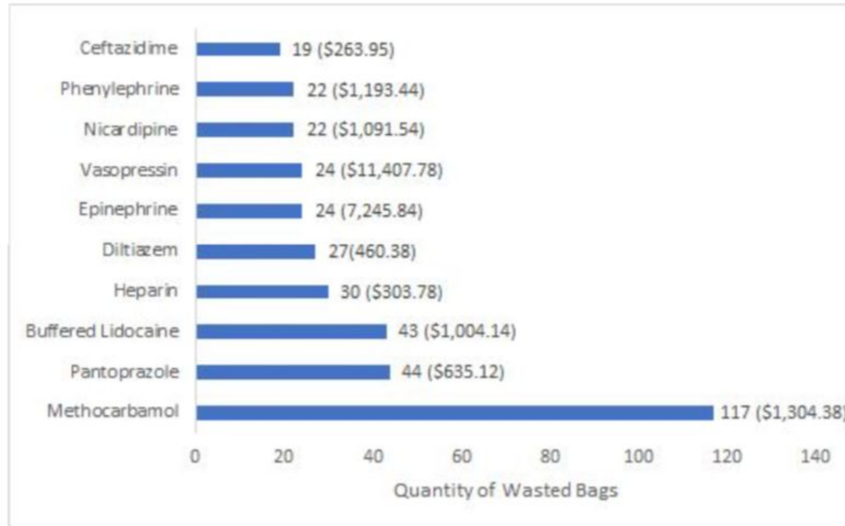

Figure 3A: Top Ten Wasted Drugs
Graphical representation of the top ten wasted drugs by number of wasted bags and cost of such waste at Hospital A.

Figure 3B: Top Ten Wasted Drugs
Graphical representation of the top ten wasted drugs by number of wasted bags and cost of such waste at Hospital B.

Results

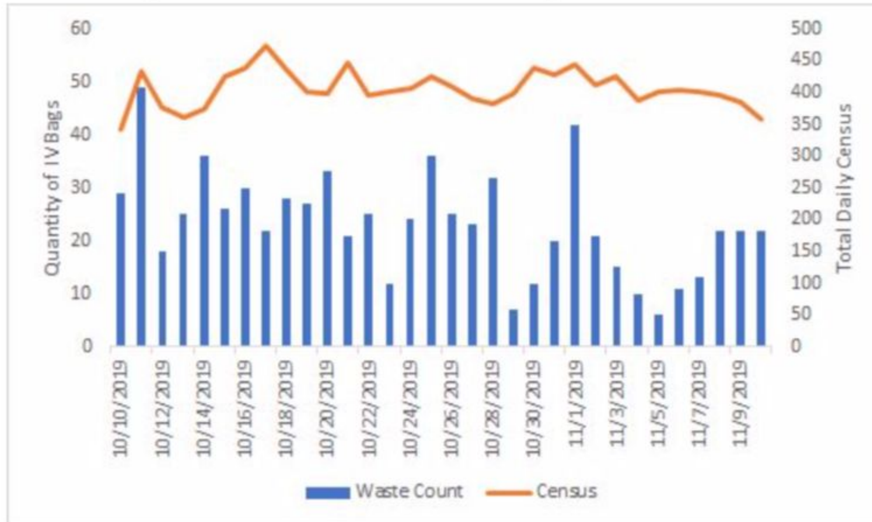

Figure 4A: Quantity of Waste vs Census
Combination chart of total daily waste count versus total daily census at Hospital A.

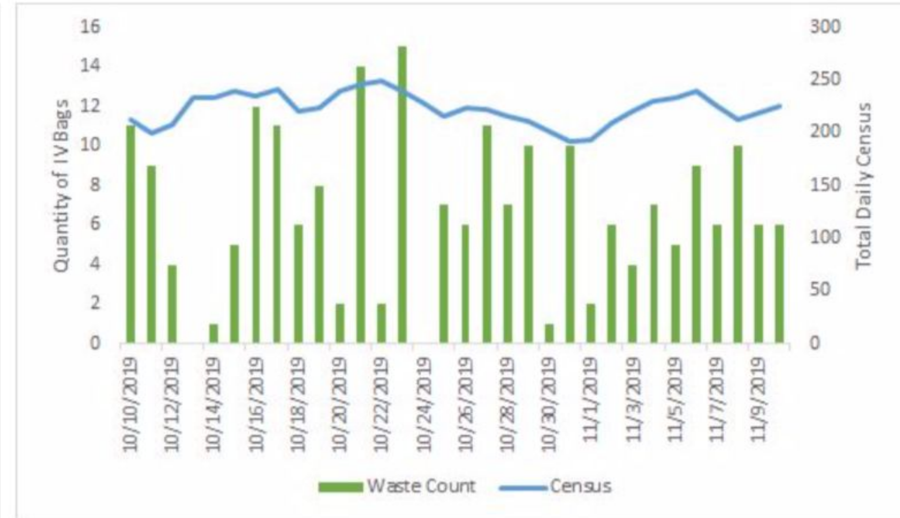

Figure 4B: Quantity of Waste vs Census
Combination chart of total daily waste count versus total daily census at Hospital B.

Discussion

Upon analysis of waste patterns, the following trends were observed:

I. Extra dose/unused and expired medications accounted for 95.6% and 98.6%, respectively, of total medication waste. Notably, the two categories are highly correlated as unused medications subsequently expire.
II. The largest amount of waste in both institutions was observed in intensive care units. Under that circumstance, the waste may be attributed to the standard of care which patients receive, although not delineated in this study.
III. The top medications wasted at Hospital A include methocarbamol ($1,304.38), pantoprazole ($635.12), and buffered lidocaine ($1,004.14), and at Hospital B include potassium chloride ($80.92), norepinephrine ($692.58), and levetiracetam ($215.42).
IV. Both hospitals observed proportional trends in waste vs census. Instances where the amount of waste collected was inversely related to the census can be due to differences in formulary and critical state of the patient.
V. At Hospital A, the top 10 medications wasted accounted for 43.4% ($24,910.33) of the total cost ($57,410.31). At Hospital B, the top 10 medications wasted accounted for 38.2% ($3,672.38) of the total cost ($9,607.84).

Limitations

- Factors which affect internal validity
  - The hospitals in the study differed in: census, batch processes, and recycling measures
  - AWP estimations were used to delineate economic impact instead of proprietary costs
- Factors which affect external validity
  - Population demographics and census are variable in areas outside of the San Gabriel Valley
  - Hospital processes differ in: formulary inclusion, prescriber choices, batch processes, and frequency of deliveries
  - Study was conducted during October which may vary from other months of the year

References

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4. Kerr, T., Romine, L. Evaluation of i.v. medication waste, *American Journal of Health-System Pharmacy*, Volume 69, Issue 22, 15 November 2012, Pages 1955–1957, https://doi.org/10.2146/ajhp120120
5. *RED BOOK® System*. Retrieved February 10, 2020, from http: micromedexsolutions.com. Greenwood Village, CO: Thomson Micromedex.
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Questions?

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