Implementation Gap in Chemotherapy Dose Rounding: A Stewardship Opportunity for Cost Avoidance and Waste Reduction

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Background

- Rising oncology drug costs have increased interest in stewardship strategies that reduce waste while maintaining efficacy and patient safety.
- Chemotherapy dose rounding to the nearest vial size within ±10% of the prescribed dose is supported by HOPA and prior literature as a safe and effective cost-savings strategy.[1,2,3]
- Previous studies have demonstrated significant reductions in drug waste and costs through dose-rounding programs without compromising clinical outcomes.[1,2]
- Despite institutional approval and published support, real-world implementation of dose-rounding policies remains inconsistent.

Objectives

- Evaluate the implementation and utilization of a pharmacist-driven chemotherapy dose-rounding policy.
- Estimate missed cost avoidance and preventable chemotherapy waste associated with inadequate policy adherence.
- Identify the operational impact of failed implementation despite institutional approval.

Methods

Study Design

- Retrospective observational analysis conducted at Good Samaritan Medical Center (West Palm Beach, FL)
- Study period:
  - June 1, 2025 – December 31, 2025
- Pre-implementation (June–August) and post-implementation (September–December) periods were analyzed collectively due to lack of policy adoption

Dose-Rounding Protocol

- P&T-approved pharmacist-driven chemotherapy dose-rounding policy
- Included doses rounded to the nearest vial size within ±10% of the prescribed dose
- Pharmacists were authorized to round eligible doses without prescriber notification

Inclusion Criteria

- Adult patients (≥18 years)
- Inpatient administration of included chemotherapy agents at GSMC

Exclusion Criteria

- Enrollment in active clinical trials, provider-specified "do not round" orders, doses not meeting protocol eligibility

Data Collection & Outcomes

- Collected variables included: calculated dose, administered dose, vial size, dose-rounding eligibility, drug waste, wholesales acquisition cost (WAC)

Primary Outcome

- Estimated cost avoidance assuming 75% and 100% policy adherence

Secondary Outcomes

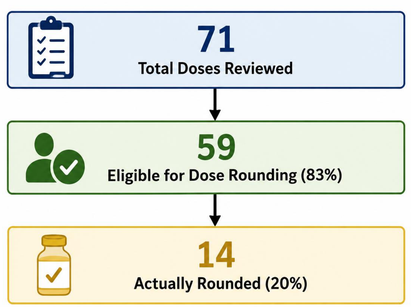
- Percentage of eligible doses rounded
- Reduction in chemotherapy waste (mg)

Table 1. Chemotherapy Agents Included in Dose-Rounding Protocol

Agent	Common Vial Sizes Evaluated
Bendamustine	25 mg, 100 mg
Bevacizumab	100 mg/4 mL, 400 mg/16 mL
Cyclophosphamide	500 mg, 1 g, 2 g
Gemcitabine	200 mg, 1 g, 2 g
Pemetrexed	100 mg, 500 mg
Rituximab	100 mg/10 mL, 500 mg/50 mL
Trastuzumab	150 mg, 420 mg

Results

Figure 1. Dose Review and Eligibility Flow



Note: Eligibility defined as doses within ±10% of the nearest vial size.

Figure 2. Dose Rounding Utilization Before and After Policy Implementation

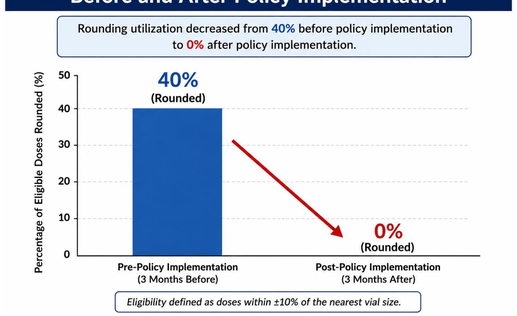


Figure 3. Estimated Cost Avoidance Over 6 Months

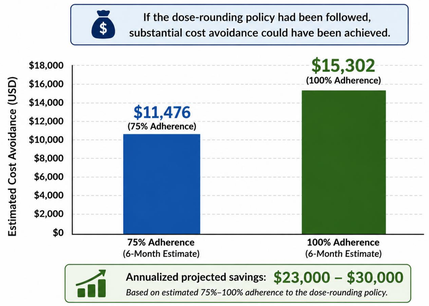


Figure 4. Potential Reduction in Chemotherapy Waste

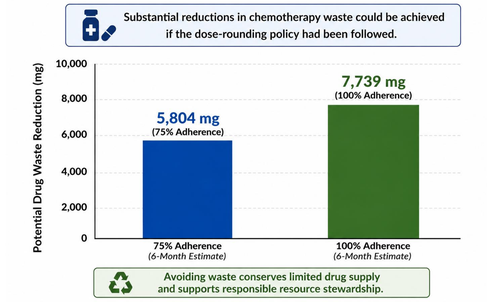


Figure 5. Dose Eligibility for Dose Rounding

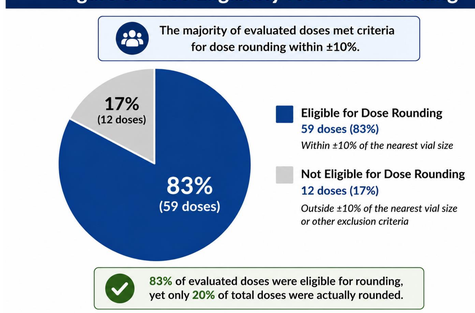


Figure 6. ANNUALIZED COST IMPACT

Results

Dose-Rounding Eligibility & Utilization

- A total of 71 chemotherapy doses were evaluated during the 6-month study period.
- 59 doses (83%) met criteria for dose rounding within ±10% of the prescribed dose.
- However, only 14 doses (20%) were rounded in practice.

Pre- vs Post-Policy

- Pre-policy: ~40% of eligible doses rounded
- Post-policy: 0% of eligible doses rounded

Estimated Missed Cost Avoidance

- Estimated missed cost avoidance over 6 months was:
  - $11,476 at 75% adherence
  - $15,302 at 100% adherence
- This corresponds to an estimated annualized missed savings of approximately:
  - $23,000–$30,000 per year

Discussion

- Chemotherapy dose rounding has been consistently supported in the literature as a safe and effective oncology stewardship strategy that reduces drug waste and overall medication expenditures without compromising clinical outcomes.[1–3]
- **Implementation gap:** Despite strong clinical rationale, institutional approval, and pharmacist authorization to independently round eligible doses, implementation at our institution was unsuccessful.
- Although 83% of evaluated doses met criteria for rounding, only 20% of total doses were rounded in practice, and utilization declined to 0% following policy implementation.
- These findings demonstrate a significant implementation gap between policy approval and operational adoption in clinical practice.
- **Potential barriers contributing to failed implementation may have included**:
  - Workflow burden during pharmacist verification
  - Limited education or awareness regarding protocol expectations
  - Lack of accountability or compliance monitoring
  - Absence of integration into standardized electronic workflows
  - Competing operational and clinical priorities
- Despite inconsistent implementation, projected analysis demonstrated substantial opportunities for cost avoidance and reduction in chemotherapy waste.
- **Financial impact:** Estimated missed savings exceeded $15,000 over 6 months, corresponding to approximately $23,000–$30,000 annually at a single community medical center.
- These findings suggest that successful oncology stewardship and integration into routine clinical practice requires more than policy approval alone and likely depends on:
  - Workflow integration
  - Pharmacist engagement
  - Standardized implementation processes
  - Ongoing compliance monitoring and feedback

Conclusion

- Implementation of a pharmacist-driven chemotherapy dose-rounding policy did not translate into clinical practice, resulting in substantial missed, and preventable, costs and waste avoidance.
- Meaningful financial and operational benefits may be achievable with successful implementation of dose-rounding initiatives.

References

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2. Shah VS, Irvine C, McWilliams RR, Singh P, Soefje SA. Reducing Cancer Drug Cost: 3-Year Analysis of Automated Dose Rounding in Electronic Health Records. JCO Oncology Practice. 2025;21(3):400-407. doi:https://doi.org/10.1200/op.23.00688
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