

Introduction

Adverse drug events (ADEs) are one of the leading causes of morbidity and mortality in healthcare. The cost of drug-related morbidity and mortality is estimated to be \$136 billion annually, which is more than the total cost of cardiovascular or diabetic care in the United States.¹

Pharmacists are poised to reduce the number of preventable ADEs and mitigate possible harm through their pharmaceutical expertise. Numerous studies demonstrate the impact of pharmacists' interventions in reducing possible ADEs and improving patient outcomes.²⁻³ Despite ample evidence of the value of the clinical pharmacist role, the clinical and financial advantage of their interventions is often underestimated by key stakeholders.

To date, there is a paucity of universal standards to define pharmacist interventions and guidance on the best way to demonstrate financial outcome in terms of direct revenue generation, cost saving or cost avoidance opportunities.

As a quality improvement initiative, a clinical pharmacist sought to determine the quality and quantity of interventions made at their site.

Objective

The purpose of this study was to assess the clinical and financial impact of pharmacist interventions in a rural, integrated health system specialty pharmacy.

Methodology

- **Study Design:** A retrospective, observational study
- **Data Source:** Clinical pharmacist intervention document at the Clearway Health Midwest client site
- **Study Population:** Any patient with at least one documented intervention by the clinical pharmacist at the Midwest client site from January 1st, 2024 to April 30th, 2024
- **Exclusion:** Patients with no documentation in the intervention document. Patients at all other Clearway Health sites
- **Statistical Analysis:** Descriptive statistics were utilized to evaluate intervention categories, provider acceptance rates and cost avoidance

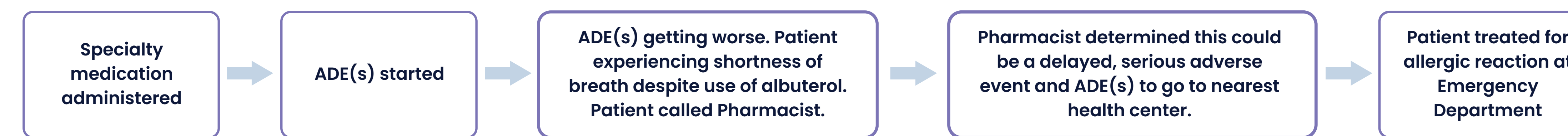
Results

Cost Avoidance Calculation⁴⁻⁵

$$\text{Sum of all Cost Avoidance} - \left(\text{Proportion of Pharmacist Time} \times \text{Pharmacist Salary} \right) = \text{Net Cost Avoidance}$$

The probability of an ADE occurring without a pharmacist intervention is the following: 60% for potentially lethal errors, 40% for serious, 10% for significant, 1% minor or 0% for no error.

Based on previous studies and adjusted for inflation, the estimated cost of a single ADE is \$8,668.69.

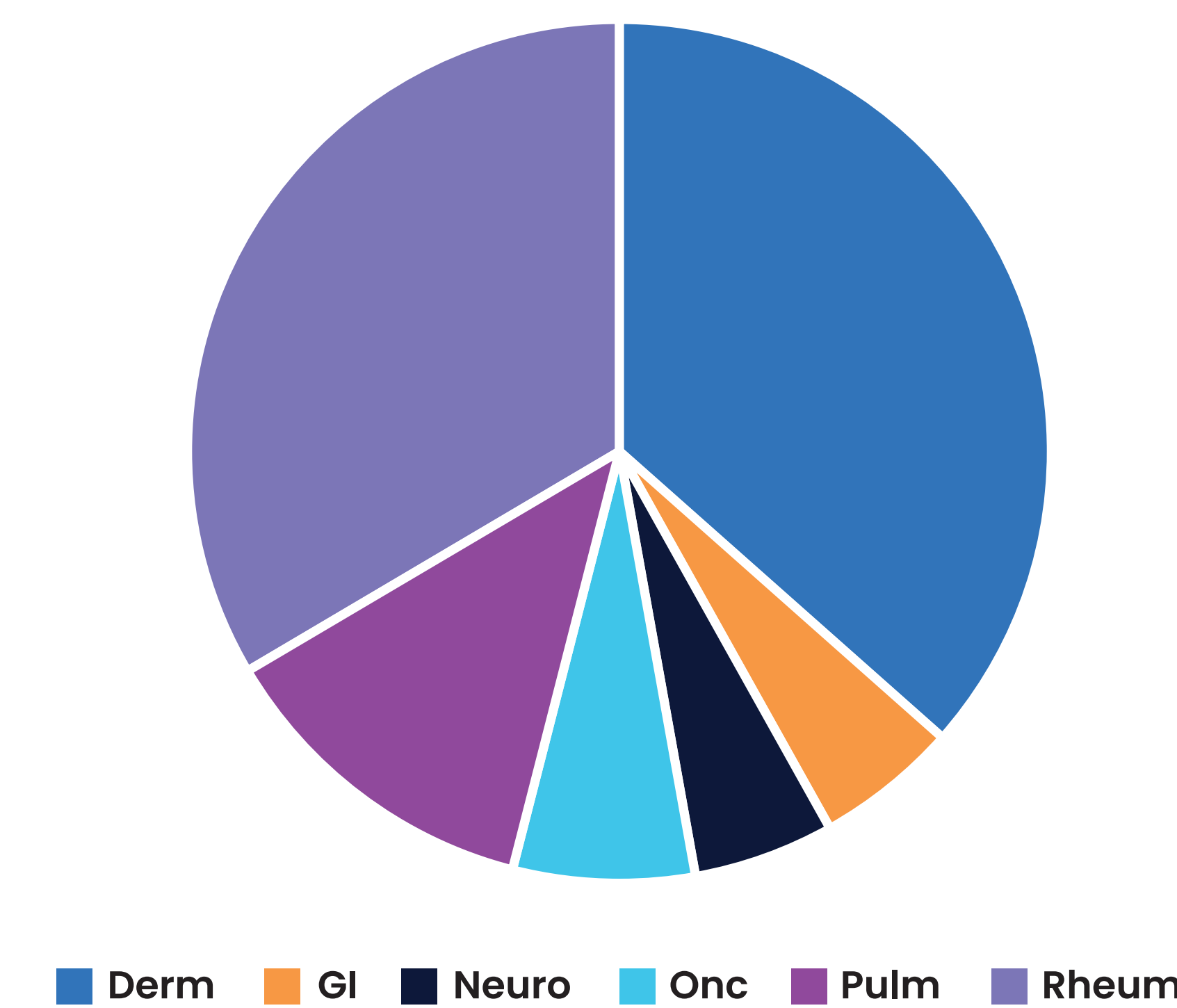


The panel categorized this as a lethal adverse event and the calculated cost avoidance from this intervention was \$5,201.21.

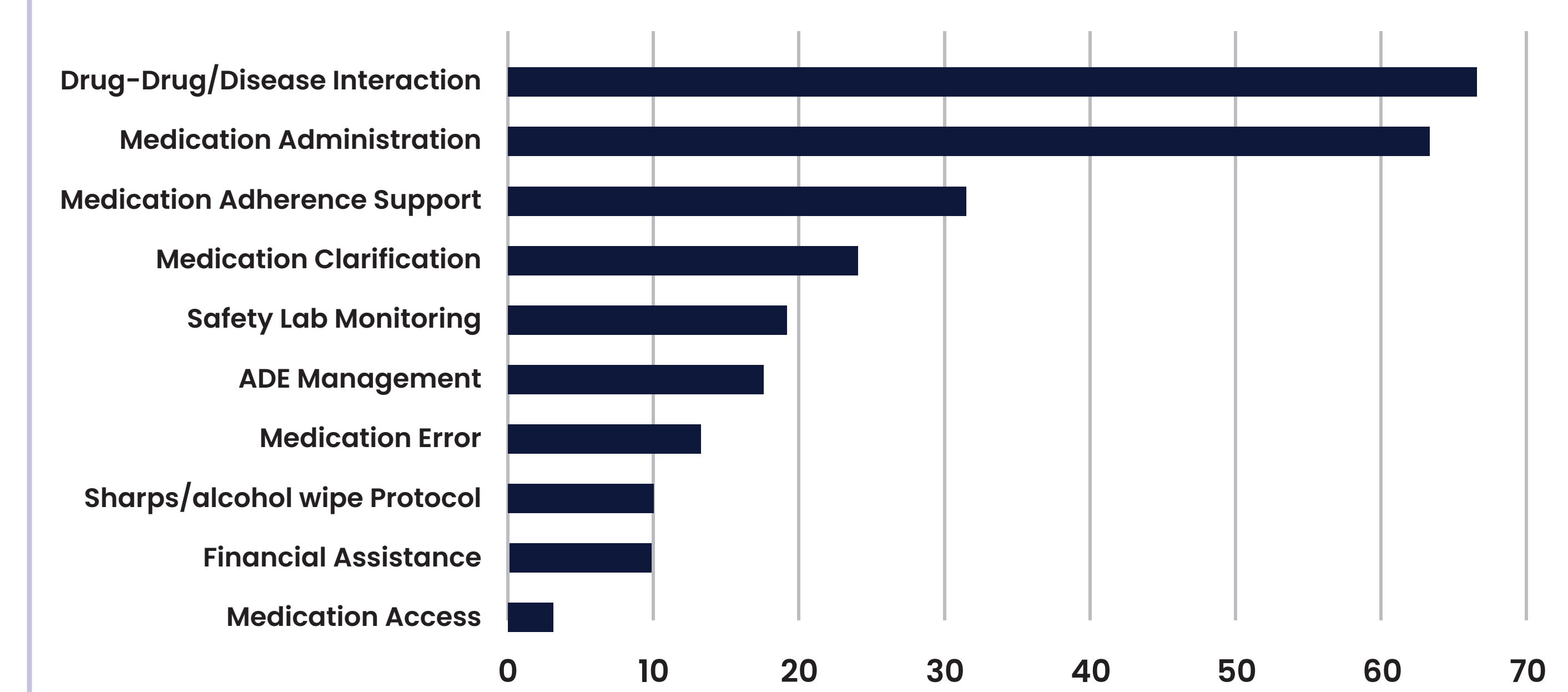
The Panel's Adverse Event Grade Definitions (non-exhaustive list)

Patient Support	Adding copay cards or speaking about insurance issues.	68
Minor	Advising on vaccinations or non-adherence counseling.	93
Significant	More than simple counseling that requires provider intervention. Treated outpatient for causative issue.	38
Serious	Baseline medication labs not drawn (tuberculosis for biologic), deviation from standard of care or guidelines with no reasoning provided.	28
Lethal	Strong risk of death. Urgent attention needed immediately.	5
Total Event Count		232

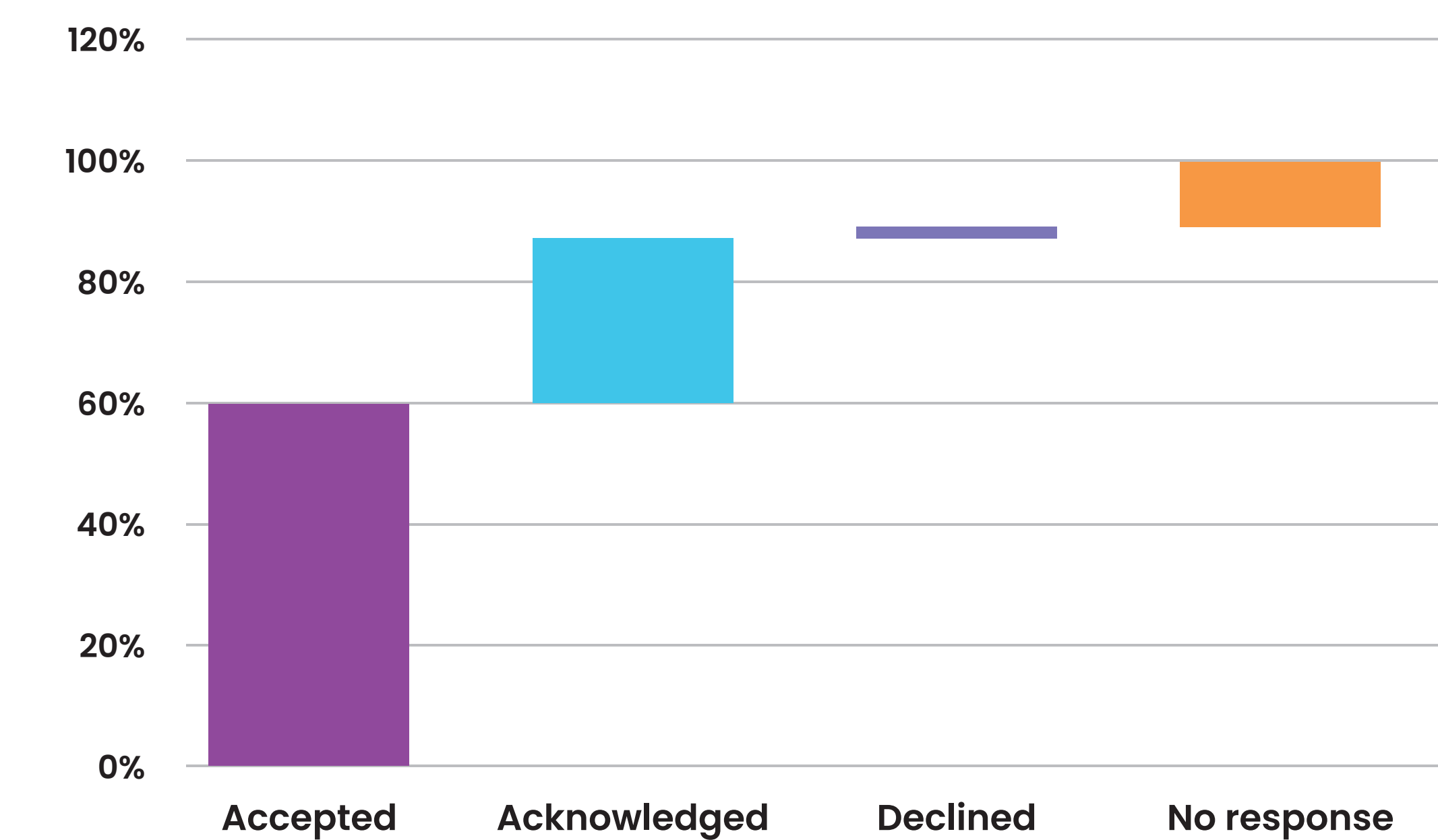
Intervention by Therapeutic Area



Primary Interventions



Provider Intervention Acceptance Rate



Discussion

There were 462 documented primary interventions for 232 patients with a mean intervention of 1.9 per patient. The most common primary interventions were drug-drug and drug-disease interactions, medication administration counseling and medication adherence support. Providers accepted or acknowledged 94.5% of pharmacist interventions. Pharmacist interventions resulted in \$176,872.09 of cost avoidance over four months.

This study demonstrated that pharmacist interventions and recommendations were overwhelmingly accepted by providers and patients. The impact of a clinical pharmacist's heterogeneous interventions ultimately lead to improved clinical and financial outcomes.

Recently the NASP Clinical Outcomes Committee have put forth intervention recommendations. This study adds the economic value to the committee's recommendations for metric consistency to highlight each pharmacy's best practices.

References

1. <https://www.fda.gov/drugs/drug-interactions-labeling/preventable-adverse-drug-reactions-focus-drug-interactions>
2. Ramalho de Oliveira D, Brummel AR, Miller DB. Medication therapy management: 10 years of experience in a large integrated health care system. *J Manag Care Pharm.* 2010;16(3):185-195.
3. Mutnick AH, Sterba KJ, Peroutka JA, Sloan NE, Beltz EA, Sorenson MK. Cost savings and avoidance from clinical interventions. *Am J Health-Syst Pharm.* 1997;54(4):392-396.
4. Sebaaly J, Parsons LB, Pilch NA, Bullington W, Hayes GL, Easterling H. Clinical and Financial Impact of Pharmacist Involvement in Discharge Medication Reconciliation at an Academic Medical Center: A Prospective Pilot Study. *Hosp Pharm.* 2015;50(6):505-513.
5. Todd W. Nesbit, Kenneth M. Shermock, Mary Beth Bobek, Donna L. Capozzi, Patricia A. Flores, Mandy C. Leonard, Jennifer K. Long, Michael A. Militello, David A. White, Louis D. Barone, Morton P. Goldman, David A. Kvanecz. Implementation and pharmacoeconomic analysis of a clinical staff pharmacist practice model. *American Journal of Health-System Pharmacy, Volume 58, Issue 9, 1 May 2001, Pages 784-790*

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