

BACKGROUND

- Children's Hospital of Orange County Specialty Pharmacy (CHOC SP) is an accredited, integrated pediatric health system specialty pharmacy (HSSP).¹
- CHOC SP services patients with cystic fibrosis (CF), inflammatory bowel disease (IBD), rheumatology and inflammatory conditions (RIC), and growth hormone (GH) disorders.
- Studies have shown integrated specialty pharmacies improve patient outcomes including increased adherence and patient and provider satisfaction.^{2,3}
- Analyses regarding tangible benefits of interventions and related cost avoidance from SP pharmacists' interventions in a pediatric health systems specialty pharmacy are scarce.

OBJECTIVES

- Primary objective of this study was to quantify pharmacists' clinical interventions and report the cost avoidance associated with SP in our pediatric ambulatory care clinics.
- Secondary objectives include severity classification and prevention of adverse drug events (ADE), and estimated pharmacist time spent.

METHODS

- Single-center, retrospective cohort study examining interventions documented by pharmacists for CHOC patients in TherigySTMSM, a therapy management software with integrated tools for data collection for clinical interventions.

Inclusion Criteria

- Patients followed by specialty providers at CHOC for CF, IBD, RIC, or GH disease states.
- Opted into clinical management service by CHOC SP between January 1, 2023 to December 31, 2023.

- Patients were excluded if they were not being followed by specialty providers at CHOC for the above disease states.
- Data collected: demographics, therapeutic category, clinical intervention details and time spent on it by the pharmacist.
- Cost avoidance quantification was calculated using published models: Naranjo scale^{6,7} and Nesbit method.⁸
- Types of interventions evaluated included ones that were systematically assigned a cost avoidance impact based on current literature: drug interactions, drug not indicated, adverse drug events, drug allergy.
- The Common Terminology Criteria for Adverse Events (CTCAE) was used to determine impact/severity of the level of care needed to treat an ADE if one occurred.⁹
- Average health charges of care reported from the Pediatric Health Information System® (PHIS) data from fiscal year 2022 was utilized to determine cost avoidance.¹¹

RESULTS

Table 1. Baseline Demographics and Clinical Characteristic of Patients (N = 180)

Demographics	
Age (mean, range)	11.5 yrs, 1.3 months-22.9 yrs
Male, n (%)	82 (46%)
Patients by Therapeutic Category, n (%)	
Cystic Fibrosis	32 (17.8%)
Growth Hormones	89 (49.4%)
Inflammatory Bowel Disease	30 (16.7%)
Rheumatology/Inflammatory Conditions	29 (16.1%)

Table 2. Interventions Overview

Total Number of Interventions*		312
Interventions Leading to Cost Avoidance*		149
Clinical Impact of Cost Saving Interventions, n (%)	Low (Coordinated Care)	47 (31.5)
	Medium (Prevented Clinic Visit)	82 (55.0)
	High (Prevented ED/Hospital Admission)	20 (13.4)
Pharmacist Time Spent*	Minutes	No. of interventions
	0 – 15	221
	16 – 30	71
	31 – 45	9
	46 – 60	3
> 60 min	8	

* Some interventions did not have documented time spent or quantifiable cost avoidance metrics, such as drug shortage management and coordination of care

Figure 1. Pharmacist Time Spent Versus Impact

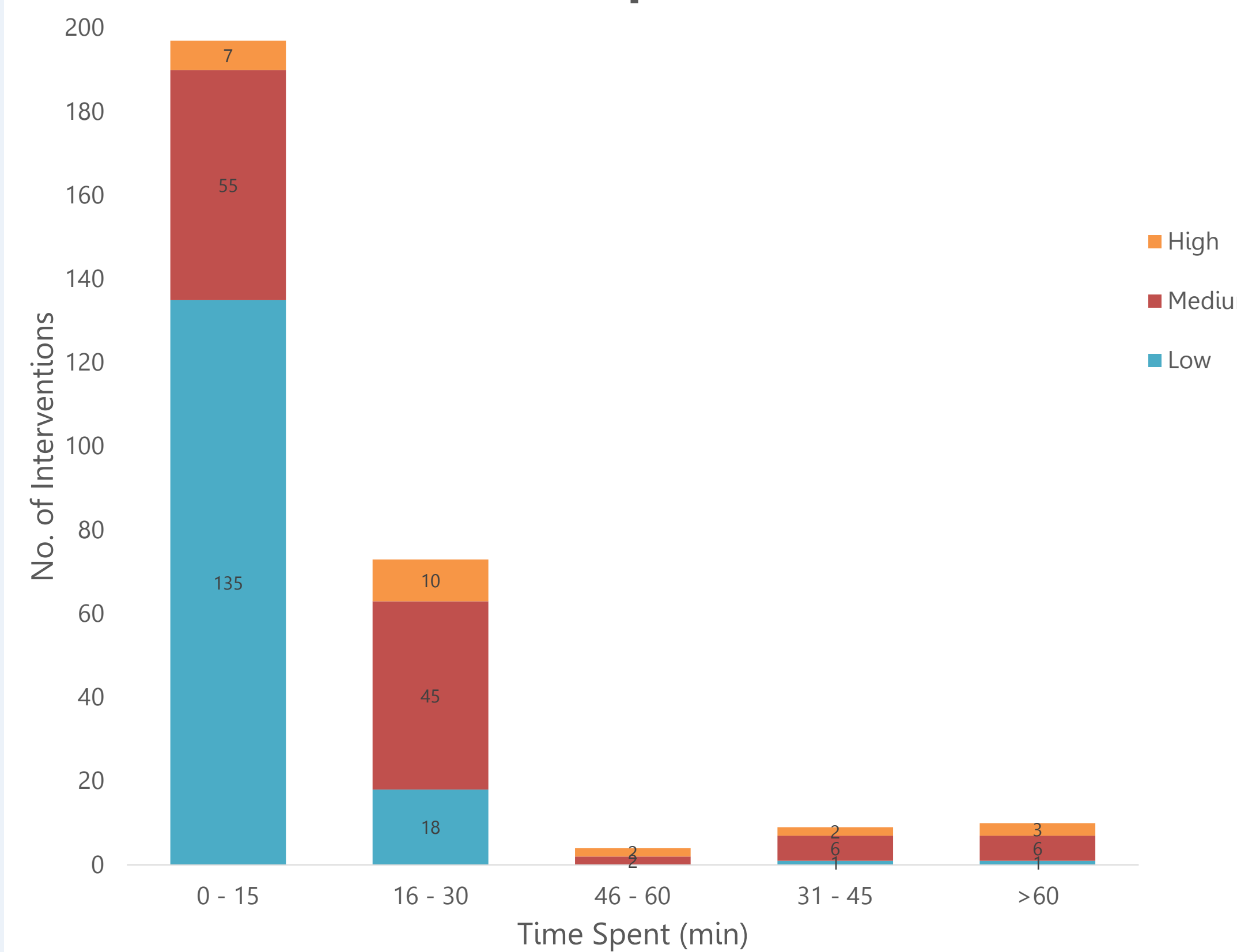
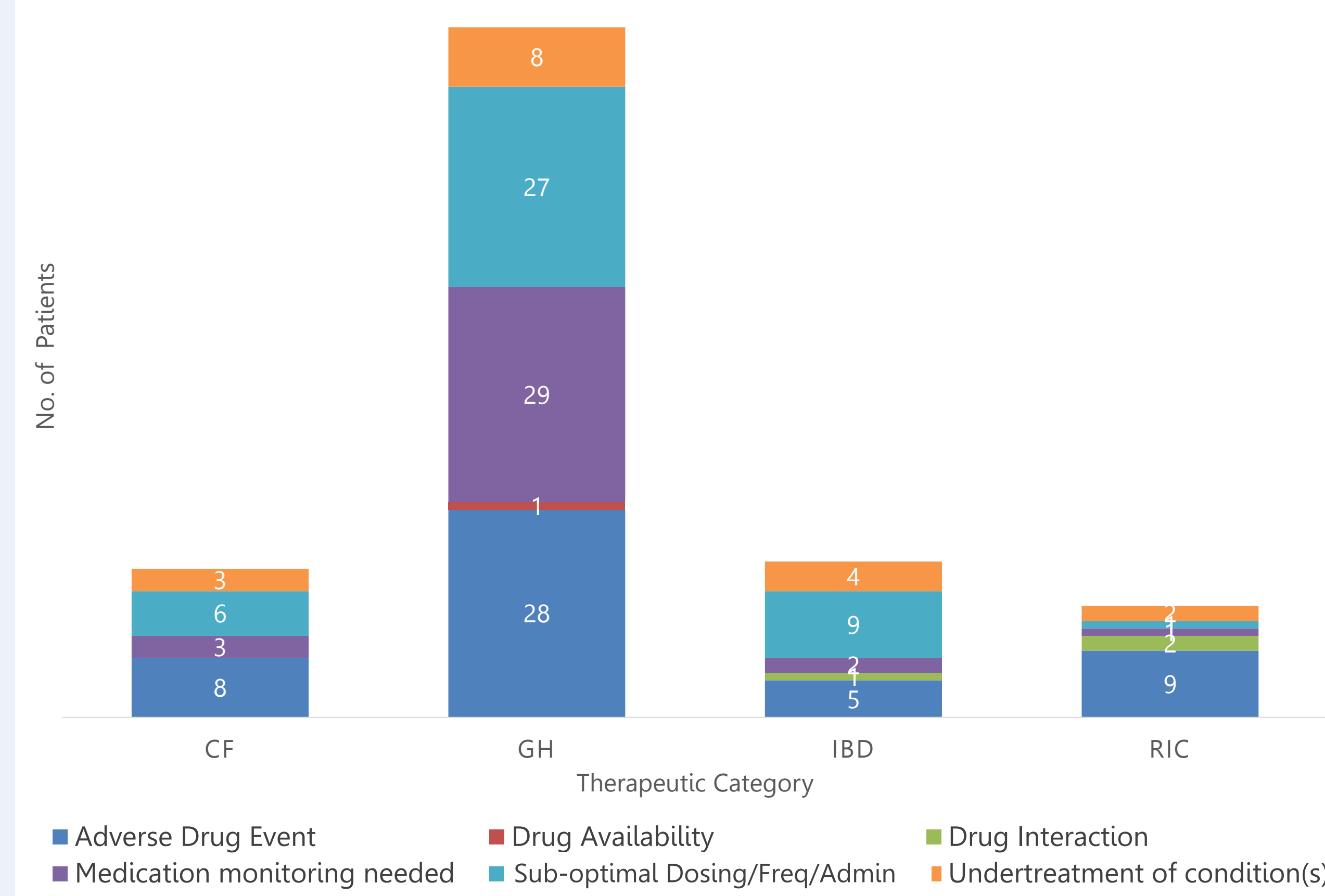


Figure 2. Intervention Activities by Therapeutic Category



** A total of 5 ADE (16%) were reported to MedWatch due to high severity

Figure 3. Cost Avoidance by Intervention Types

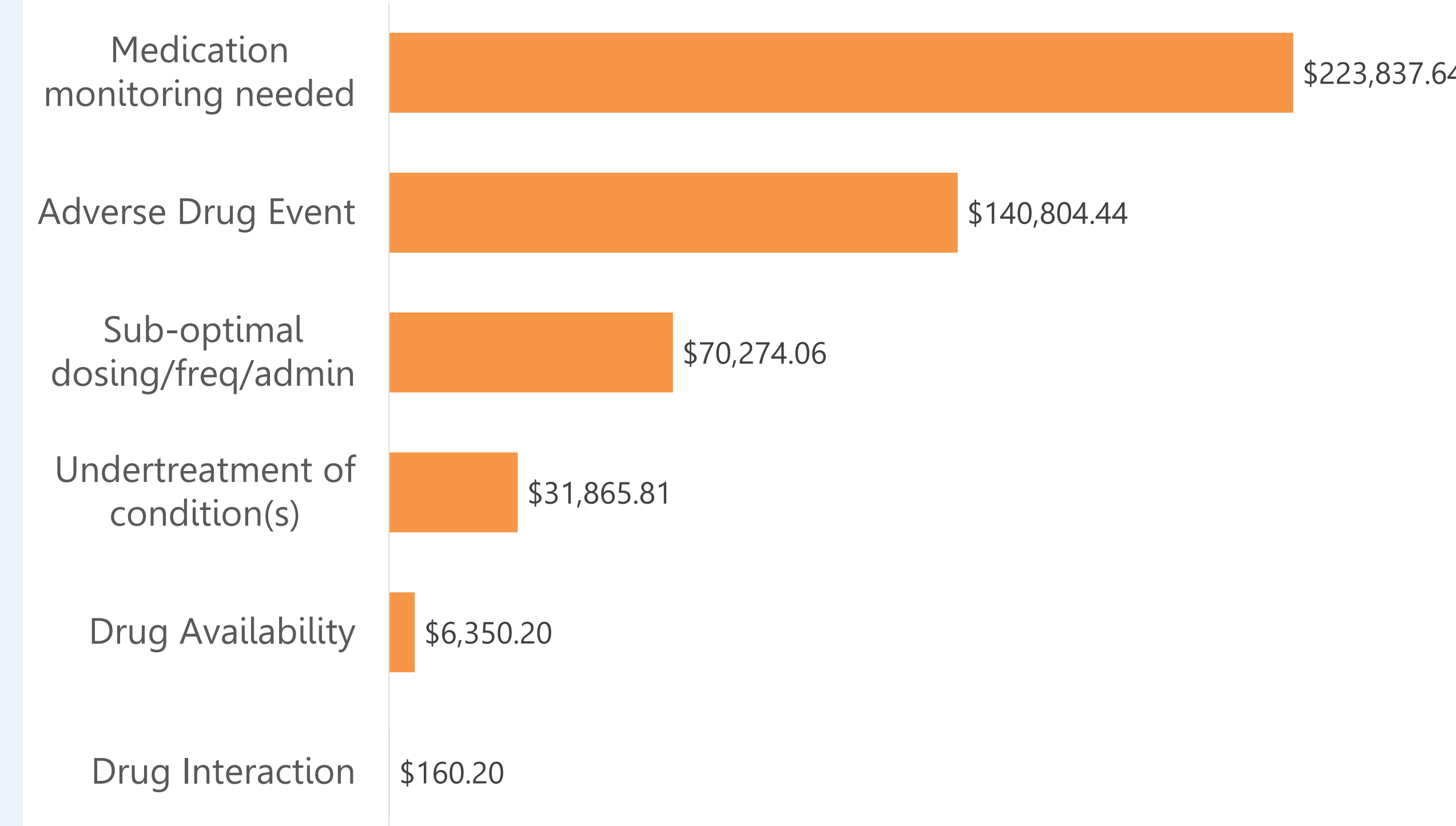
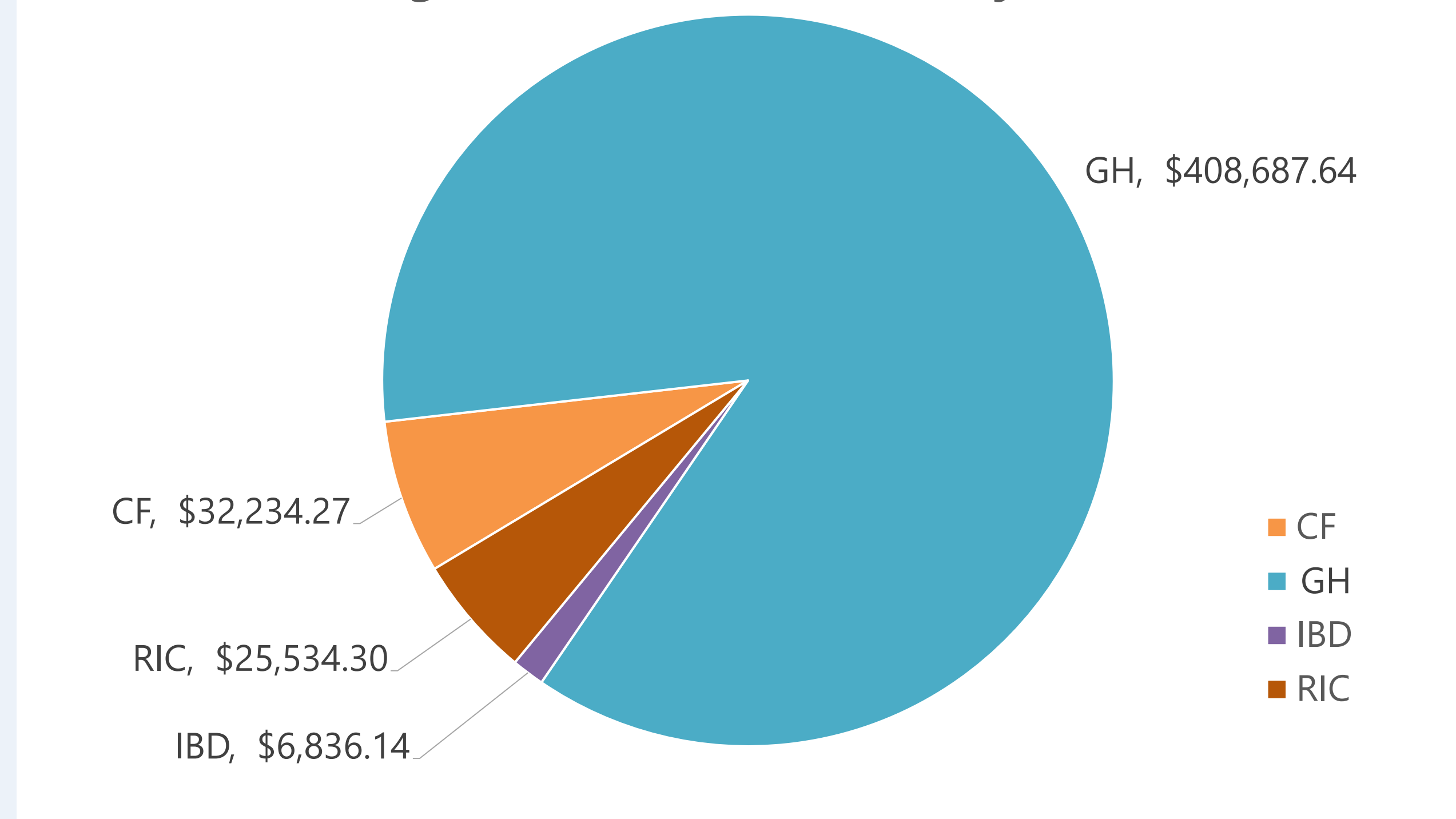


Figure 4. Cost Avoidance by Disease State



DISCUSSION

- A total of 312 interventions were performed, with 149 having additional cost avoidance implications.
 - The therapeutic categories with the most documented interventions were GH disorders and CF.
 - The largest category of interventions were in Medium/Prevented clinic visit (55.0%).
- An estimated total of \$473,292.35 was quantified as cost avoidance—Medication monitoring (47.3%) and ADE prevention/ management (29.7%) being the largest contributors to these savings.
- There were a large number of clinical activities and interventions that were unable to be assigned an associated cost avoidance to (e.g. coordination of care (42.9%), shortage mitigation, etc.).
- Limitations:
 - Average cost of a clinic visit was not available from PHIS. The financial data was extrapolated from Yung et al using rate of inflation.¹⁰
 - It is not possible to remove the subjective nature when assessing the impact/severity of an intervention.

CONCLUSIONS

- SP pharmacists are in a position to perform clinical interventions that can result in potential cost avoidance for the health system.
- Being able to quantify potential cost avoidance from pharmacist interventions can help advocate for pharmacy service expansions into specialty care clinics.
- A large proportion of pharmacists' time are also spent on activities or interventions that currently do not, but potentially could, have an associated cost avoidance.
- Potential cost savings and intervention trends vary amongst HSSP due to differences in protocols, areas of practice, and specific challenges at the time (e.g. shortages, recalls, natural disasters etc.)
- The subjective nature of impact quantification can be minimized by establishing intervention documentation models, following published literature, and a review committee.

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