

Impact of Medically Integrated Specialty Pharmacy Services on Outcomes in Metastatic Prostate Cancer Patients Receiving Androgen Receptor Pathway Inhibitors

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Introduction

- Prostate cancer is one of the most common cancers in men worldwide, with 1 in 8 men diagnosed in their lifetime¹
- An estimated 313,780 new cases are expected in 2025²
- Prostate-specific antigen (PSA) and testosterone levels are essential for monitoring disease progression and treatment response³
- Oral androgen receptor pathway inhibitors (ARPIs), like abiraterone, apalutamide, darolutamide, and enzalutamide, improve outcomes but require careful oversight due to toxicity risks, adherence challenges, and complex regimens³
- Medically integrated (clinic-based) specialty pharmacists provide:
 - Comprehensive education and counseling
 - Adherence support and toxicity management
 - Drug-drug interaction review
 - Structured follow-up assessments^{4,9}
- Research shows that specialty pharmacist-directed programs improve adherence, reduce therapy initiation delays, and positively influence clinical outcomes⁴⁻⁹

Objectives

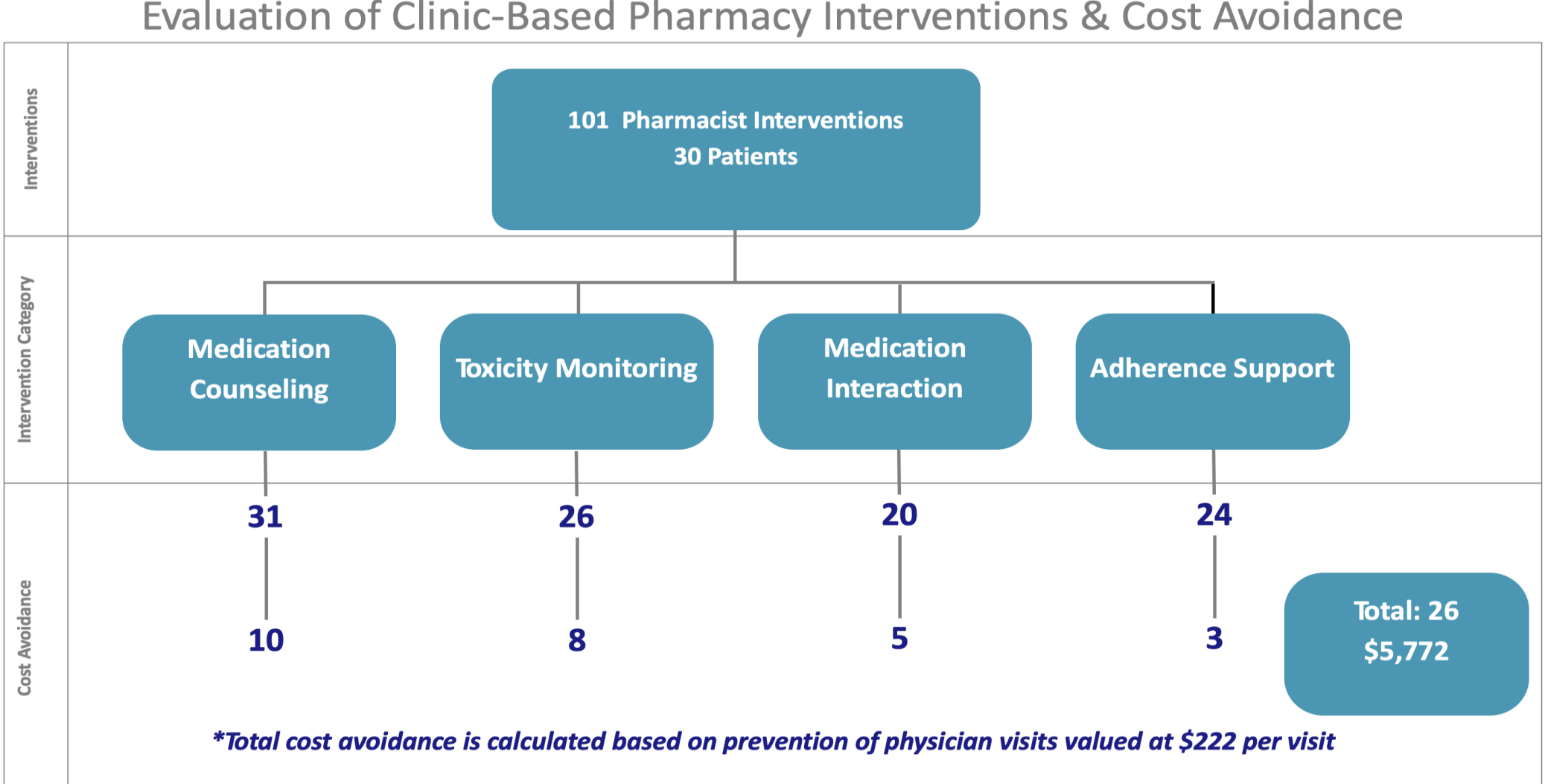
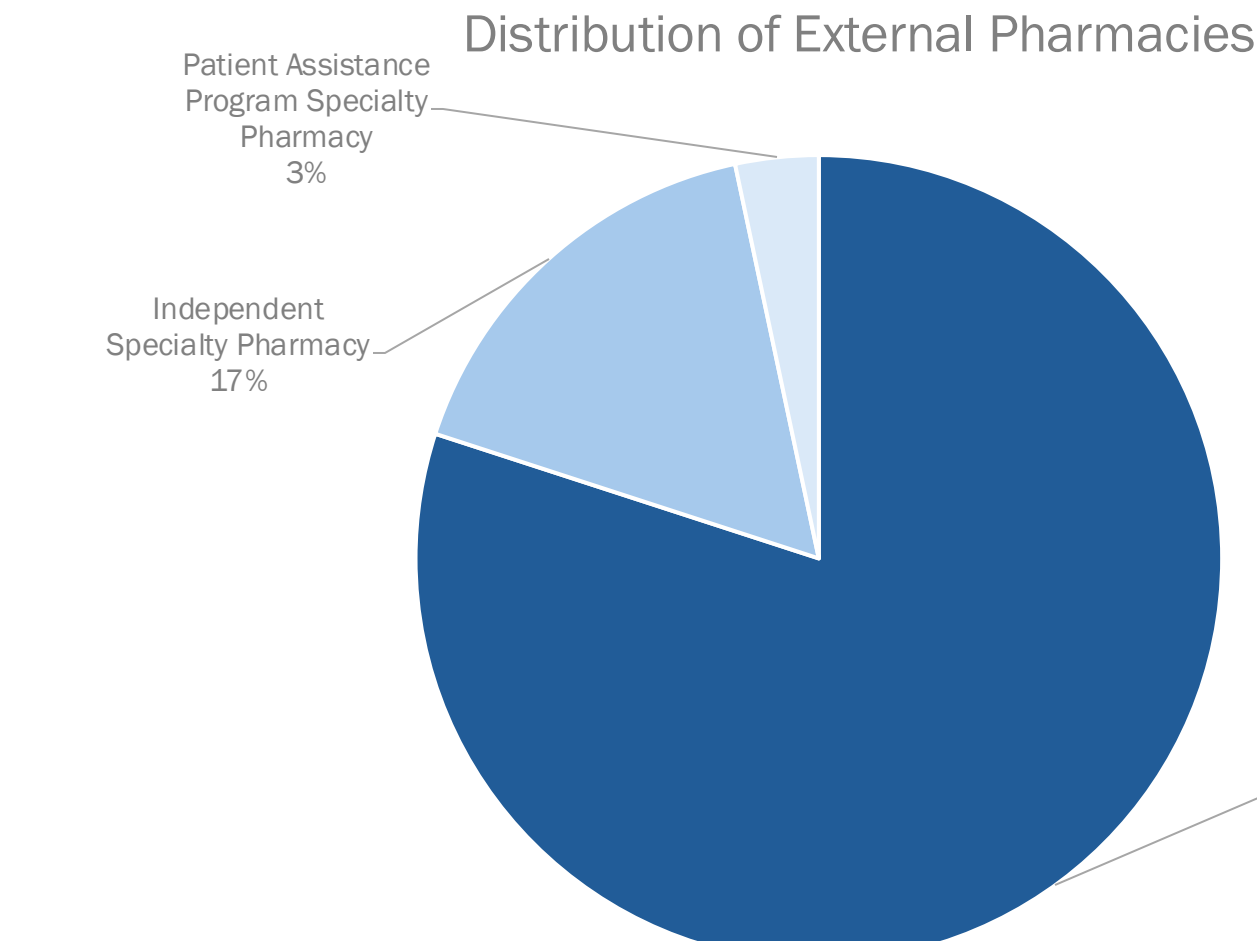
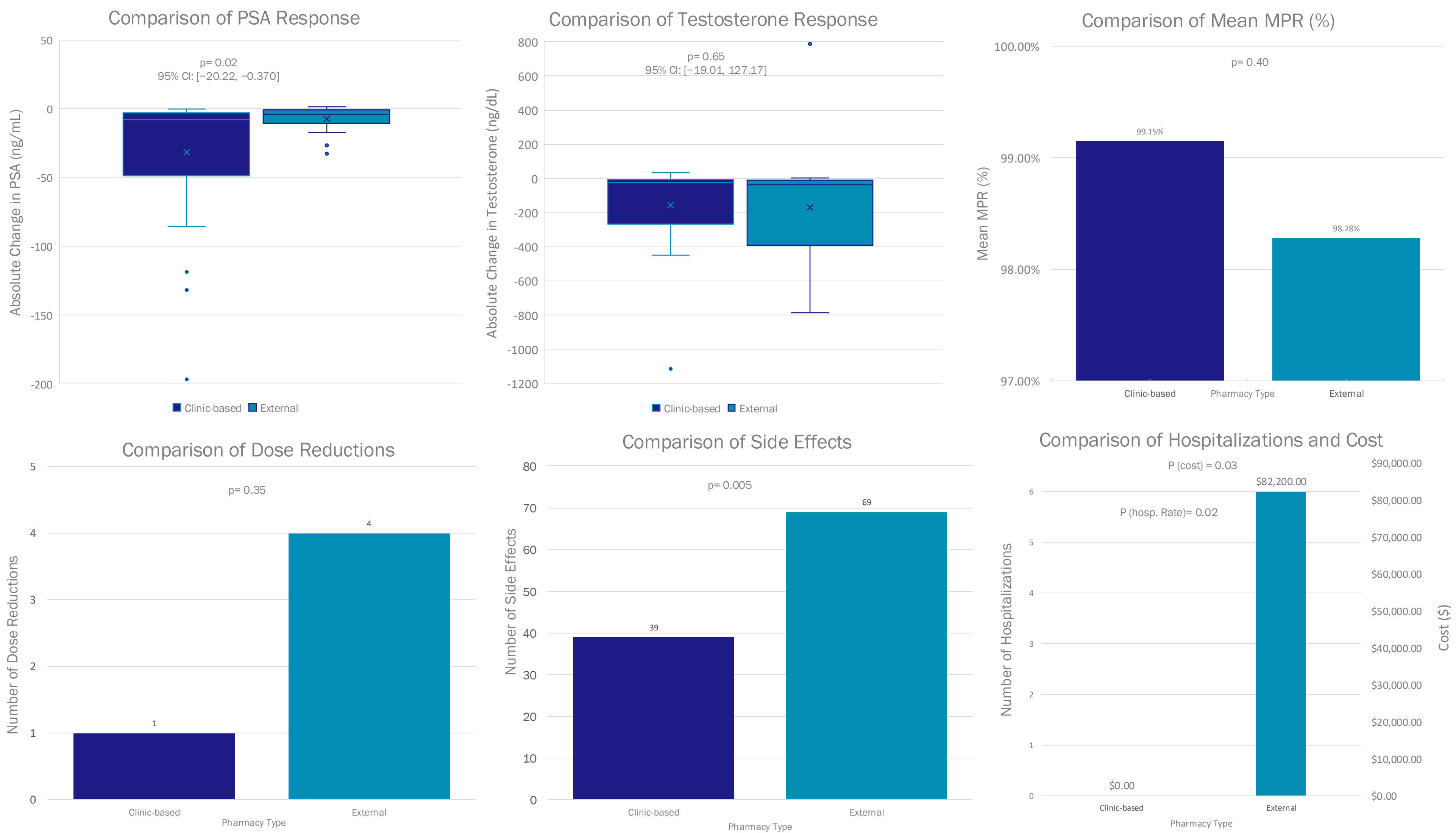
- Primary Objective**
- To evaluate the impact of comprehensive clinical services provided by clinical pharmacists in a medically integrated (clinic-based) specialty pharmacy on clinical outcomes, measured by changes in PSA and testosterone levels in patients with metastatic prostate cancer receiving ARPIs
- Secondary Objectives**
- To assess the effect of pharmacist interventions on medication adherence, measured by Medication Possession Ratio (MPR)
 - To compare hospitalization rates between the integrated and external specialty pharmacy cohorts
 - To compare the frequency of ARPI dose reductions between cohorts

Methods

- Study Design:** Single-center, retrospective cohort study conducted at an NCI-designated comprehensive cancer center
- Eligibility Criteria:** Adults aged 18 years or older, with a baseline PSA of less than 200, who received six consecutive ARPI prescription fills through either a medically integrated (clinic-based) or an external specialty pharmacy between January 1, 2024, and June 30, 2025
- Cohort Stratification:** Patients were categorized based on specialty pharmacy type: clinic-based vs external
- Exclusion Criteria:** Patients who received ARPI therapy for a non-metastatic indication, were treated with triplet therapy, had fewer than six consecutive months of ARPI treatment, or had incomplete pharmacy records that prevented evaluation of adherence or pharmacist interventions. Additional exclusions included insufficient follow-up laboratory data to assess PSA or testosterone response, and cases in which counseling occurred outside the medically integrated specialty pharmacy model

Results

Baseline Characteristics	Clinic Pharmacy (N = 30)	External Pharmacy (N = 30)	P value
Age - Mean (SD)	72 (8.1)	69.5 (8.7)	0.254
Sex - No. (%) Male	30 (100)	30 (100)	1
Weight - Mean (SD)	95.4 (15.6)	93.8 (12.5)	0.66
Race - No. (%) White	27 (90)	26 (86.7)	0.97
Insurance - No. (%) Medicare	25 (83.3)	18 (60)	0.71
Date of Diagnosis			
1996 - 2005	1 (3.3)	0 (0)	
2006 - 2015	5 (16.7)	6 (20)	
2016 - 2025	24 (80)	24 (80)	0.58
Gleason Score - No. (%)			
Gleason 5	0 (0)	1 (3.3)	
Gleason 7	6 (20)	8 (26.7)	
Gleason 8	6 (20)	8 (26.7)	
Gleason 9	12 (40)	8 (26.7)	
Gleason 10	0 (0)	1 (3.3)	0.51
Location of Metastases - No. (%)			
Bone	20 (66.7)	20 (66.7)	
Liver	1 (3.3)	1 (3.3)	
Lymph Nodes	8 (26.7)	9 (30)	
Lung	1 (3.3)	0 (0)	0.79
ARPI - No. (%)			
Abiraterone	20 (66.7)	20 (66.7)	
Apalutamide	2 (6.7)	1 (3.3)	
Darolutamide	0 (0)	1 (3.3)	
Enzalutamide	8 (26.7)	8 (26.7)	0.72



Conclusions

- Clinic-based pharmacy cohort demonstrated a **statistically significant and greater absolute reduction in PSA** relative to patients managed through external specialty pharmacies
- Testosterone levels showed no statistically significant difference between groups, likely due to variability in testing frequency and limited monitoring
- Patients in the integrated specialty pharmacy model (clinic-based) experienced **statistically significant fewer hospitalizations** (0 vs 6 in the external cohort), highlighting the benefits of closer clinical oversight and earlier intervention, with an estimated **cost savings of \$82,200.00**
- Clinic-based pharmacy cohort reported **statistically significant fewer side effects** (69 vs 39), indicating improved therapy tolerance
- Pharmacist-led interventions** in the clinic-based pharmacy cohort reduced health care utilization by preventing physician visits, resulting in an additional \$5,776.00 in cost avoidance
- Overall, medically integrated (clinic-based) specialty pharmacy services achieved **statistically significant improvements in PSA response, reduced toxicities, and decreased healthcare utilization** compared with external specialty pharmacies

Evaluation

- Limitations**
- Retrospective, single-center design limits generalizability
 - Small sample size may reduce statistical power
 - Inconsistent testosterone monitoring across providers may limit the accuracy of comparisons between cohorts
 - Unmeasured confounders, including comorbidities and socioeconomic factors may have influenced outcomes and could not be fully accounted for in this retrospective analysis

- Future Directions**
- Expand analysis to multicenter cohorts to validate findings
 - Evaluate long-term outcomes such as progression-free survival and treatment persistence
 - Incorporate patient-reported outcomes to better assess symptom burden and pharmacist impact
 - Standardize laboratory monitoring to improve completeness of response data

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Disclosures

Authors of this study have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this study.