Cost and Wastage Estimates for an Oral Oncology Medication Split-Fill Option in a Patient Management Program.

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Payers have the opportunity to reduce pharmacy costs when patient's start on a new cancer medication. Statistical comparisons between the matched patients indicated the split fill process was effective on reducing pharmacy costs for all months, lowering initial copay, and increasing persistency in the second month. Modeled wastage was meaningfully lower for all months.

OBJECTIVES

- To compare patients with pharmacy benefit designs that include a split-fill option to similar patients without this option on patient discontinuation rates, patient reported side-effects, estimated pharmacy costs, and potential wastage. During the study period, 11 of the 15 medications were available, an extended list from prior studies.[1,2,3,4]

METHODS

- Study design: Retrospective cohort.
- Patient exclusion criteria: < age 6; off-label pediatric medication; residing outside U.S. state territories; greater than a 40 day supply on initial dispense; starting with two concurrent oral oncolytic medications
- Propensity matching (1:1 greedy match algorithm) used to compare cohorts (split-fill vs. non split-fill). Propensity variables: Patient age, gender, state census areas, index medication, start date as historical half-year segmentation, and use of more than a single medication.
- Paired t-test were conducted on the outcomes of payer costs, copay cost, and persistency on matched patients.
- Wastage was modeled for only the non split-fill patients using the split-fill patient discontinuation rate, and no statistical analysis

Figure 1. Potential wastage in fill patterns for non split-fill based on rates of discontinuations in split-fill patterns applied to non split-fill discontinuations.

Cohort	Pattern	First Month 1st half	First Month 2nd half	Second Month (discontinuations) 1st half	Second Month (discontinuations) 2nd half
Non Split Fill	A	30 days fill ---------->		No fill	
	B		30 days fill ---------->		No fill
Split fill	A	1st 14 day fill ---------->	2nd 14 day fill ---------->	No fill	
	B		1st 14 day fill ---------->	2nd 14 day fill ---------->	No fill

RESULTS

- 2,363 of 2,473 patients within CMP met selection criteria
- 672 identified in the split-fill program and 1,691 in non split-fill
- One case did not match to a control patient, reducing the matched count to 671 per cohort
- Post-matched comparisons on propensity variables indicated differences within the accepted 10% value of standardized differences (see Table 1.)

Table 1. Standardized differences pre- and post-propensity matching, and post-propensity descriptive statistics.

	Standardized Differences		Post Propensity Descriptive Statistics	
Variable	Pre-match	Post-match	Case	Control
Age	-0.047	0.002	57.6 (11.8)	57.6 (13.9)
Female	-0.091	-0.015	49.6%	50.3%
Census area	0.498*	0.014		
Central EN,WN,ES			50.3%	49.7%
New England, Mid Atlantic			50.2%	49.8%
South Atlantic, WS Central			49.2%	50.8%
Mountain, Pacific			49.8%	50.2%
Index Medication	0.144*	0.082		
sorafenib			20.2%	20.2%
everolimus			15.2%	15.2%
sunitinib			15.0%	16.8%
pazopanib			13.9%	12.7%
erlotinib			13.1%	12.4%
dasatinib			9.9%	10.1%
nilotinib			6.1%	6.3%
crizotinib			3.6%	3.4%
ceritinib			1.9%	2.1%
vorinostat			0.6%	0.3%
bexarotene			0.3%	0.2%
Use 2+ medications	0.057	0.015	48.8%	51.2%
Historical 6 months	0.144*	0.023		
1st			49.9%	50.1%
2nd			49.2%	50.8%
3rd			50.6%	49.4%
4th			50.5%	49.5%

*Difference exceeds 0.10 criterion

- Persistency (i.e., no discontinuation at 45 days): Significantly higher (p<.0001) for the split-fill group compared to non split-fill in the second month (71.6% vs 67.0%).
- Copay: In first month, split-fill had $132.50 lower copay than non split-fill (p<.007).
- Pharmacy costs: Difference between cohorts in pharmacy costs was significantly lower for split-fill cohort per month, with the three month average being $2,724.97 AWP (see Table 2).
- Split-fill rates applied to weight non split-fill rate in modeling wastage (pattern A rates multiplied + pattern B rates multiplied): 28.2% of non split-fill patients discontinued (wastage).

- The average wastage for non-split fill patients was $2,782.29 AWP assuming that the latter 14 days of the month were not used as modeled (see Table 3).
- Patient reported side-effects did not differ significantly between cohorts, either in prevalence rates or time to first report.

Table 2. Monthly mean plan costs (AWP) difference for non split-fill compared to matched split-fill patients.

Non Split Fill Cost Difference from Split Fill		
Month Filled	AWP $*	Std. Dev.
1	3,118.90	6,787.40
2	2,259.80	6,989.10
3	2,796.20	8,261.50
3 month average	2,724.97	

*P<0.0001

Table 3. Non split-fill AWP for potential wastage due to discontinuation (weighted by split-fill discontinuation rates).

Month Filled	AWP $ PUPM*	AWP $ 14 days
1	5,180.87	2,612.64
2	5,144.93	2,680.95
3	5,908.20	3,053.28
3 month average	5,411.34	2,782.29

*PUPM=per utilizing patient per month

CONCLUSIONS

- Implementing a split-fill process within a pharmacy management program for the first three months of a new therapy may result in: lower discontinuation rates; lower copay; significantly reduced pharmacy costs; reduced potential wastage.
- By opting to adopt split-fill component, third party payers have a means of reducing the pharmacy cost for new therapy oncolytics
- Other researchers have also found similar benefits for modifying the quantity of initial fills for different therapies.[5,6,7]

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