

Abandoning Oral Oncolytic Prescriptions at the Pharmacy: Patient and Health Plan Factors Influencing Adherence

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Abstract

Background: Oral oncolytic agents are an increasingly important component of cancer therapy. Adherence with therapy begins with filling the prescription in a timely manner. Little is known of the factors associated with abandonment of oral oncolytics at the initial or subsequent prescription.

Methods: This cross-sectional study analyzed a nationally representative pharmacy claims database and identified 10,508 Medicare and commercial patients initiating oral oncolytic therapy between 2007 and 2009. We calculated the rate of abandonment of the initial claim, where abandonment was defined as the reversal of an adjudicated pharmacy claim without a subsequent paid claim for any oncolytic (oral or IV) within the subsequent 90 days. The likelihood of abandonment was assessed using bivariate and multivariate logistic regression analyses including patient demographic factors, plan type, drug type, cost-sharing and number of other prescriptions.

Results: The abandonment rate of newly initiated oral oncolytic agents was 10.0%. Unadjusted bivariate analyses found that high cost-sharing, larger prescription burden, lower income, and Medicare coverage were associated with a higher abandonment rate ($p < 0.05$). Our logistic regression model found that as both cost-sharing and concurrent prescription use rose, there was a significantly higher likelihood of abandonment. Claims with cost-sharing over \$500 were 4 times more likely to be abandoned than claims with cost-sharing of \$100 or less ($OR = 4.46, p < 0.001$). Medicare patients were more likely to have cost-sharing over \$500 than patients with commercial plans ($p < 0.001$). Patients with 5 or more prescriptions in the previous month had 50% higher likelihood to abandon than patients with no prescription burden ($OR = 1.50, p < 0.001$).

Conclusions: Abandonment of newly prescribed oral oncolytic therapy is not uncommon, and the likelihood increases for patients enrolled in plans with pharmacy benefit designs that require high cost sharing. Higher prescription burden was also associated with a larger abandonment rate. These factors should be taken into account when considering likely adherence to cancer therapy.



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Background

- Cancer patients require timely access to appropriate treatments in order to achieve optimal outcomes
- Oral oncolytic medications are becoming more prevalent for a range of malignancies. It is estimated that 25-35% of the current cancer drug pipeline is represented by oral agents.^{1,2} However, little is known about patient adherence to these medications.
- This study assesses the abandonment rate of newly-initiated oral oncolytics, and specifically whether abandonment is associated with patient and insurance plan characteristics

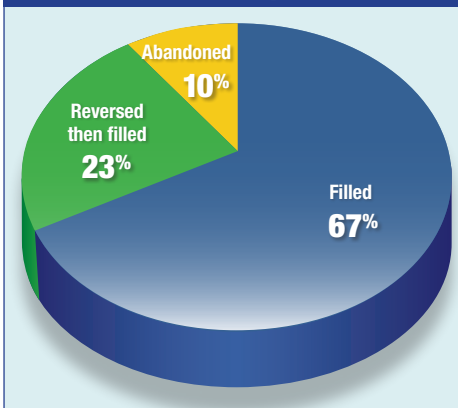
Methods

- From a nationally representative pharmacy claims database, we created a dataset with 10,508 patients initiating oral oncolytic therapy between May 1, 2007, and March 31, 2009. Inclusion criteria were:
 - Claim was paid or reversed, but not rejected, for the following drugs: capecitabine, imatinib, sorafenib, lenalidomide, sunitinib, erlotinib, temozolomide, and lapatinib
 - Claim was newly-initiated, defined as a patient having no other oncolytic claims (oral or IV) in the preceding 120 days
 - Patient had active prescription claims in the dataset at least 120 days before and 90 days after the first fill to ensure eligibility and data capture
 - Patient insurance coverage was Medicare or commercial plan only
 - Each patient had complete data for all model variables (this reduced our initial sample of 20,607 patients to the final sample of 10,508)
- We calculated the rate of abandonment, which was defined as the reversal of an adjudicated pharmacy claim without a subsequent paid claim for any oral or IV oncolytic within the following 90 days
- We assessed the impact of demographic and plan factors influencing the abandonment rate of new oral oncolytic claims through:
 - Demographic and plan factors: age, gender, income, geographic region, cost-sharing amount, insurance type, study drug and prescription activity (a measure of burden based upon the number of claim transactions submitted for non-cancer drugs in the previous 30 days)
 - Descriptive analysis comparing follow-up status of reversed claims with study variables
 - Logistic regression analysis comparing paid and abandoned claims and their relationship to patient demographic factors, study drug, cost-sharing, and prescription activity
 - A sub-analysis was conducted that included the same covariates as the above logistic regression model plus a variable for insurance plan type (commercial vs. Medicare). A variable to designate the calendar quarter was added to control for the impact of the Medicare coverage gap. The sample was restricted to claims from calendar year 2008.

Results

- Approximately half of the patients in our sample were younger than 65 years old, slightly more likely to be female, more likely to have an income between \$40,000 and \$75,000, and most commonly from the South. Most patients were insured by a commercial plan.
- 10% of patients abandoned their first prescription for an oral oncolytic agent, with nearly another quarter of patients eventually filling a prescription for an oncolytic, with varying degrees of delay, ranging from the same day to up to 90 days. (Figure 1)
- Unadjusted bivariate analyses found that high cost-sharing, increased prescription activity, and lower income was related to higher abandonment rates ($p < 0.05$)
- Patients with Medicare coverage also had higher rates of abandonment (16%) versus commercial patients (9%) ($p < 0.05$)
- There were statistically significant differences in abandonment rates across study drugs ($p < 0.05$)

Figure 1: Outcome of Newly-Initiated Oral Oncolytic Prescriptions



- Based upon an assessment of cost-sharing distributions a larger proportion of Medicare patients experienced higher cost-sharing than commercially-insured patients, with 46% of Medicare patients having cost-sharing more than \$500 versus 11% of commercial patients ($p < 0.001$)
- Results of the logistic regression analysis showed that abandonment increased as cost-sharing and concurrent prescription activity rose, when controlling for all other variables (Table 2)
 - Claims with cost-sharing over \$500 had more than four times the likelihood of abandonment versus claims with cost-sharing of \$100 or less ($p < 0.05$)
 - Patients with 2-5 prescription claims and patients with more than 5 claims in the previous month had a 26% and 50% higher likelihood of abandoning the oral oncolytic agent (respectively) versus patients without concurrent prescription activity ($p < 0.05$)
 - Patients with income lower than \$40,000 were 20% more likely to abandon versus patients with incomes more than \$75,000 ($p = 0.058$)
- There was no significant association between Medicare or commercial plans or income level and abandonment, when controlling for other factors. Claims submitted in the 2nd, 3rd and 4th quarter of 2008 had higher likelihood of abandonment, as compared to the first quarter of 2008 (45%, 48%, 29%, respectively).

Limitations

- While we attempted to control for capturing complete pharmacy claims data from a broad sample of the marketplace, it is possible that patients may have accessed pharmacies outside of our sample. The degree to which we were not able to capture a patient's follow-up represented by these cases would impact overall calculated abandonment rates.
- Our dataset utilized pharmacy claims for this analysis, which included some IV medications. Future research would benefit from integrating additional clinical and medical claims data to assess IV follow-up and control for diagnoses and comorbidities.
- We did not have access to data that would identify patients who abandoned a claim but might have followed up with medication provided through a Patient Assistance Program (PAP).

Conclusions

- One-third of patients either abandoned their first prescription for an oral oncolytic agent or experienced varying degrees of delay in filling a prescription for an oncolytic.
- The abandonment rate for oral oncolytics is higher than rates for other chronic therapeutic classes reported in the literature.³
- Patients with Medicare coverage and lower incomes had higher rates of abandonment of oral oncolytics.
- Out-of-pocket costs played a significant role with regard to the likelihood that a patient would abandon the first fill of an oral oncolytic agent. One in four patients filling prescriptions with cost-sharing amounts over \$500 abandoned the prescription and did not follow up with another oncology medication within 90 days.
- Drug therapy complexity (prescription activity/burden) is also a significant driver of abandonment of oral oncolytic agents.
- These factors should be taken into account when considering likely adherence to cancer therapy as well as when constructing plan benefit designs. Policymakers may also want to consider the specific implications of higher cost-sharing faced by the Medicare population.

Acknowledgment

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Table 1: Adjudication Status of Newly-Initiated Oral Oncolytic Claims

Patient Characteristic	Total N	Total %	Adjudication Status of Newly-Initiated Oral Oncolytic	
			Paid or Reversed with Follow-up N (%)	Abandoned N (%)
Total Patients	10,508	100.0%	9,455 (90.0%)	1,053 (10.0%)
Age*				
0-40	302	2.9%	272 (90.1%)	30 (9.9%)
41-65	5,109	48.6%	4,672 (91.5%)	437 (8.6%)
66-80	3,837	36.5%	3,419 (89.1%)	418 (10.9%)
≥81	1,260	12.0%	1,092 (86.7%)	168 (13.3%)
Gender				
Female	5,548	52.8%	5,009 (90.3%)	539 (9.7%)
Male	4,960	47.2%	4,446 (89.6%)	514 (10.4%)
Annual Household Income*				
<\$40K	2,721	25.9%	2,410 (88.6%)	311 (11.4%)
\$40K-\$75K	4,038	38.4%	3,626 (89.8%)	412 (10.2%)
>\$75K	3,749	35.7%	3,419 (91.2%)	330 (8.8%)
Geographic Region				
Midwest	2,355	22.4%	2,105 (89.4%)	250 (10.6%)
Northeast	2,764	26.3%	2,479 (89.7%)	285 (10.3%)
South	3,692	35.1%	3,343 (90.6%)	349 (9.5%)
West	1,697	16.1%	1,528 (90.0%)	169 (10.0%)
Patient Cost-Sharing Amount*				
\$0-\$100	7,638	72.7%	7,147 (93.6%)	491 (6.4%)
\$101-\$150	271	2.6%	242 (89.3%)	29 (10.7%)
\$151-\$200	258	2.5%	234 (90.7%)	24 (9.3%)
\$201-\$250	123	1.2%	108 (87.8%)	15 (12.2%)
\$251-\$350	291	2.8%	256 (88.0%)	35 (12.0%)
\$351-\$500	200	1.9%	168 (84.0%)	32 (16.0%)
>\$500	1,727	16.4%	1,300 (75.3%)	427 (24.7%)
Insurance Type*				
Medicare	1,737	16.5%	1,467 (84.5%)	270 (15.5%)
Commercial	8,771	83.5%	7,988 (91.1%)	783 (8.9%)
Prescription Activity*				
0 Claims	3,049	29.0%	2,775 (91.0%)	274 (9.0%)
1 Claim	1,318	12.5%	1,207 (91.6%)	111 (8.4%)
2-3 Claims	2,168	20.6%	1,947 (89.8%)	221 (10.2%)
4-5 Claims	1,550	14.8%	1,383 (89.2%)	167 (10.8%)
>5 Claims	2,423	23.1%	2,143 (88.4%)	280 (11.6%)
Study Drug*				
Capecitabine	3,758	35.8%	3,527 (93.9%)	231 (6.2%)
Imatinib	1,380	13.1%	1,194 (86.5%)	186 (13.5%)
Sorafenib	460	4.4%	335 (72.8%)	125 (27.2%)
Lenalidomide	1,038	9.9%	960 (92.5%)	78 (7.5%)
Sunitinib	569	5.4%	501 (88.1%)	68 (12.0%)
Erlotinib	2,022	19.2%	1,763 (87.2%)	259 (12.8%)
Temozolomide	1,060	10.1%	982 (92.6%)	78 (7.4%)
Lapatinib	221	2.1%	193 (87.3%)	28 (12.7%)

*Chi-Square, $p < 0.05$

References

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Figure 2: Abandonment Rate of Newly-Initiated Oral Oncolytic Claims by Patient Cost-Sharing Amount

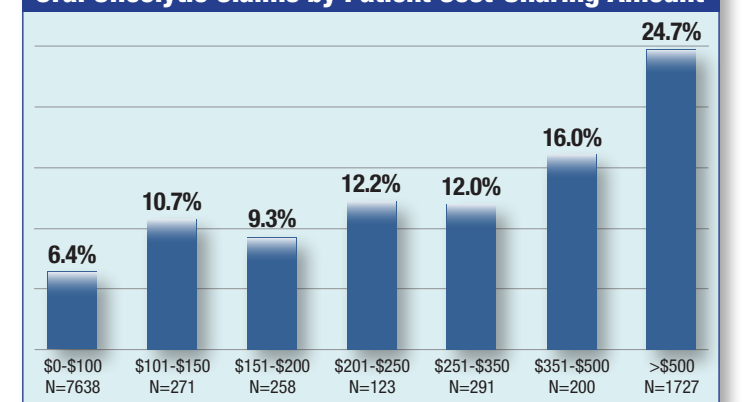


Table 2: Results of Logistic Regression of Likelihood of Abandonment of Newly-Initiated Oral Oncolytic Claims

Independent Variable	Odds Ratio	95% Confidence Interval	P-Value
Age Group (Reference = 0-40)			
41-65	0.82	0.55-1.23	0.346
66-80	0.71	0.47-1.07	0.102
≥81	0.80	0.52-1.23	0.313
Gender (Reference = Female)			
Male	0.99	0.86-1.14	0.899
Annual Household Income (Reference = >\$75K)			
<\$40K	1.19	0.99-1.41	0.058
\$40K-\$75K	1.13	0.96-1.32	0.142
Geographic Region (Reference = Midwest)			
Northeast	1.15	0.95-1.38	0.157
South	0.91	0.76-1.08	0.279
West	1.01	0.81-1.25	0.937
Patient Cost-Sharing Amount (Reference = \$0-\$100)			
\$101-\$150	1.84	1.23-2.75	0.003
\$151-\$200	1.51	0.97-2.34	0.066
\$201-\$250	2.30	1.31-4.04	0.004
\$251-\$350	2.31	1.59-3.36	<0.001
\$351-\$500	3.28	2.20-4.88	<0.001
>\$500	4.46	3.80-5.22	<0.001
Prescription Activity (Reference = 0 Claims)			
1 Claim	1.02	0.80-1.30	0.870
2-3 Claims	1.26	1.03-1.53	0.023
4-5 Claims	1.27	1.02-1.57	0.029
>5 Claims	1.50	1.24-1.81	<0.001
Study Drug (Reference = Capecitabine)			
Imatinib	2.09	1.68-2.60	<0.001
Sorafenib	4.87	3.74-6.34	<0.001
Lenalidomide	1.04	0.79-1.38	0.759
Sunitinib	1.63	1.21-2.21	0.001
Erlotinib	1.47	1.20-1.81	<0.001
Temozolomide	1.11	0.85-1.47	0.445
Lapatinib	2.15	1.39-3.33	0.001

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