

# Inpatient Psychiatry Barrier Days Analysis

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**Project Overview:**

A study of barrier days for inpatient psychiatry patients was undertaken to provide a baseline set of observations and recommendations related to challenges in patient discharges for this group of patients.

One hundred and eighty one (181) inpatient psychiatry patients were identified as having lengths of stay of 30 days or more ("long stay patients") at UVM Medical Center from 10/1/2014 through 3/31/2017 - 30 months of data. One outlier was removed from the data used.

Chart reviews to identify barrier days were conducted by analysts from the Jeffords Institute for Quality under the guidance of Isabelle Desjardins, MD. Barrier days were defined as the number of days from identification that patient is ready to be discharged to the actual day of discharge. For those patients with identified barrier days, clinical analysts assigned the patient stay to both a Barrier Days category and a Barrier to Discharge category.

We want to acknowledge our appreciation to Carol Muzzy, Anna Noonan, and the team of analysts from the Jeffords Institute for Quality who structured this project and provided the patient data for this analysis.

**Key Findings:**

**1. Overview: Long Stay Patients**

- 181 inpatient psychiatry patients had stays of 30 days or more ("long stay patients") over a 30 month period, from 10/2014 through 03/2017.
- 61% represented voluntary status patients; 39% were involuntary.
- 38% of long stay patients had no barriers to discharge.
- 62% of long stay patients experience a barrier to discharge resulting in an extended stay of some length.
- The number of long stay patients has increased significantly since FY 2015. Long stay patients grew by 20% in FY 2016, and are on track to increase by 15% in FY 2017. The projected volume of long stay patients for FY 2017 is 86, an increase of over 20 patients compared to FY 2015.

Table 1: Long Stay Patients by Legal Status

Legal Status	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days
Involuntary	35	260	18	174	18	268	71 (39%)	702 (36%)
Voluntary	28	317	57	601	25	312	110(61%)	1,230 (64%)
<b>Total</b>	<b>63</b>	<b>577</b>	<b>75</b>	<b>775</b>	<b>43</b>	<b>580</b>	<b>181</b>	<b>1,932</b>

Table 2: Number of Long Stay Patients with and without Barrier Days

Barrier Days Group	FY15	FY16	FY17 (10/16-3/17)	Total
	# of Patients	# of Patients	# of Patients	# of Patients
0 Barrier Days	24 (38%)	30 (40%)	15 (35%)	69 (38%)
>0 Barrier Days	39 (62%)	45 (60%)	28 (65%)	112 (62%)
<b>Total</b>	<b>63</b>	<b>75</b>	<b>43</b>	<b>181</b>

## 2. Frequency of Barriers to Discharge for Long Stay Patients

- Of the long stay patients, 62% (112 patients) had barriers that prevented timely discharge; 69% of involuntary long stay patients had barriers to discharge, while 54% of voluntary long stay patients had barriers.
- The number of long stay patients who experience barrier days increased by 6 patients (15%) from FY2015 to FY2016. Looking at an annualized volume for FY2017, the projected growth in long stay patients is 11 patients, a 24% increase over FY2016.

Table 3: Long Stay Patients with Barrier Days: Analysis by Barrier Day Group

Barrier Days Group	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days
0	24		30		15		69 (38%)	
1 to 5	10	35	13	43	7	29	30 (17%)	107 (6%)
6 to 10	10	73	7	50	7	55	24 (13%)	178 (9%)
11 to 15	8	107	6	86	4	55	18 (10%)	248 (13%)
16 to 20	3	54	8	140			11 (6%)	194 (10%)
21 to 25	4	90	1	21	2	45	7 (4%)	156 (8%)
26 to 30	2	56	2	54	1	27	5 (3%)	137 (7%)
31 to 40			4	142	3	101	7 (4%)	243 (13%)
31 to 50			1	49	1	39	2 (1%)	88 (5%)
50 to 100	2	162	3	190	2	123	7 (4%)	475 (25%)
> 100					1	106	1 (1%)	106 (5%)
<b>Total</b>	<b>63</b>	<b>577</b>	<b>75</b>	<b>775</b>	<b>43</b>	<b>580</b>	<b>181</b>	<b>1,932</b>

Table 4: Long Stay Patients with Barrier Days by Legal Status (Barrier Days >0)

Legal Status	FY15		FY16		FY17 (10/16-3/17)		Total	
	# and % of Patients	# and % of Barrier Days	# and % of Patients	# and % of Barrier Days	# and % of Patients	# and % of Barrier Days	# and % of Patients	# and % of Barrier Days
Involuntary	24 (62%)	260 (45%)	10 (22%)	174 (22%)	12 (43%)	268 (46%)	46 (41%)	702 (36%)
Voluntary	15 (38%)	317 (55%)	35 (78%)	601 (78%)	16 (57%)	312 (54%)	66 (59%)	1,230 (64%)
<b>Total</b>	<b>39</b>	<b>577</b>	<b>45</b>	<b>775</b>	<b>28</b>	<b>580</b>	<b>112</b>	<b>1,932</b>
<b>Avg. # of Barrier Days per Patient</b>	<b>14.8</b>		<b>17.2</b>		<b>20.7</b>		<b>17.3</b>	

## 3. Volumes, Trends, and Impact of Barrier Days

- The total number of barrier days for long stay patients is significant: 577 days in FY2015 and 775 days in FY2016. Most concerning is the increase in the total number of barrier days for the first six months of FY2017 (580 barrier days); this total, if annualized, would show an increase of nearly 50% over FY2016.
- For those patients with barrier days, 50% of patients typically have 12 or fewer barrier days. However, a few patients with lengthy challenges in discharge placement contribute significantly to the total number of barrier days: in FY2015, two (2) patients who waited 50 days or more for an appropriate discharge placement represented 28% of the groups' total barrier days. A similar situation occurs in the first half of FY2017: three (3) patients represent 229 of the 580 barrier days (39%) for the first six months of the fiscal year.
- The cost associated with total barrier days is significant: estimated costs for aggregate barrier days totaled \$540K for FY2015, and rose to \$715K in FY2016. Estimated costs for the first half of FY2017 have already exceeded \$500K.

- Eliminating or reducing barrier days would help to make beds available sooner for psychiatry patients awaiting admission. By rough calculation, bed capacity could be increased by up to two additional beds, depending on the actual reduction in barrier days achieved.

Table 5: Patient Count by Barrier Days Group (Barrier Days >0)

Barrier Days Group	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Patients	Patient Distribution	# of Patients	Patient Distribution	# of Patients	Patient Distribution	# of Patients	Patient Distribution
1 to 5	10	26%	13	29%	7	25%	30	27%
6 to 10	10	26%	7	16%	7	25%	24	21%
11 to 15	8	21%	6	13%	4	14%	18	16%
16 to 20	3	8%	8	18%		0%	11	10%
21 to 25	4	10%	1	2%	2	7%	7	6%
26 to 30	2	5%	2	4%	1	4%	5	4%
31 to 40		0%	4	9%	3	11%	7	6%
31 to 50		0%	1	2%	1	4%	2	2%
50 to 100	2	5%	3	7%	2	7%	7	6%
> 100				0%	1	4%	1	1%
<b>Total</b>	<b>39</b>	<b>100%</b>	<b>45</b>	<b>100%</b>	<b>28</b>	<b>100%</b>	<b>112</b>	<b>100%</b>

Table 6: Total Barrier Days and Their Distribution by Barrier Days Group (Barrier Days>0)

Barrier Days Group	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution
1 to 5	35	6%	43	6%	29	5%	107	6%
6 to 10	73	13%	50	6%	55	9%	178	9%
11 to 15	107	19%	86	11%	55	9%	248	13%
16 to 20	54	9%	140	18%		0%	194	10%
21 to 25	90	16%	21	3%	45	8%	156	8%
26 to 30	56	10%	54	7%	27	5%	137	7%
31 to 40		0%	142	18%	101	17%	243	13%
31 to 50		0%	49	6%	39	7%	88	5%
50 to 100	162	28%	190	25%	123	21%	475	25%
> 100				0%	106	18%	106	5%
<b>Total</b>	<b>577</b>	<b>100%</b>	<b>775</b>	<b>100%</b>	<b>580</b>	<b>100%</b>	<b>1,932</b>	<b>100%</b>

Table 7: Estimated Cost of Barrier Days

	# of Barrier Days	Estimated Cost of Barrier Days	Avg. Cost per Barrier Day
<b>FY15</b>	577	\$540,462	\$937
<b>FY16</b>	775	\$715,401	\$923
<b>FY17 (10/16-3/17)</b>	580	\$553,234	\$954
<b>Grand Total</b>	<b>1,932</b>	<b>\$1,809,096</b>	<b>\$936</b>

#### 4. Reasons for Barrier Days and Patient Discharge Placement Options

- The study classified reasons for delays in discharge to a number of different categories (see Table 8), with these categories generally in two main groups: Delays for Placement in Supervised Facilities, and Delays for Transition to Home/Shelter.
- Waits for Placement in a Supervised Facility accounted for 36-41% of patients with barrier days, and 32-49% of total barrier days – roughly 250 – 564 days per year.

- Delays to help patients with their transition to home or shelter (helping to secure outpatient services, engaging social support etc.) impact 59-64% of patients with barriers to discharge, and contribute to 38-68% of total barrier days – roughly 307-596 days annually.
- Those patients eventually discharged to Supervised Facilities represented 38% of the patients with barrier days, and 42% of the total barrier days over the study period – roughly 500 barrier days per year.
- Patients who were discharged to a home or shelter environment represented 62% of all patients with barrier days, and 58% of total barrier days.

Table 8: Long Stay Patients with Barrier Days: Analysis by Barrier to Discharge Category

	Barrier to Discharge Category	FY15		FY16		FY17 (10/16-3/17)		Total	
		# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days
Delays for Placement in Supervised Facilities	Delay in Group Home Placement	5	40	11	163	7	171	23	374
	Delay in SNF/ Assisted Living Placement	3	107	5	87	3	111	11	305
	Court Related	3	58					3	58
	Chronic High Risk of Harm to Self/Others	5	65					5	65
	<b>Total</b>	<b>16 (41%)</b>	<b>270 (47%)</b>	<b>16 (36%)</b>	<b>250 (32%)</b>	<b>10 (36%)</b>	<b>282 (49%)</b>	<b>42 (38%)</b>	<b>802(42%)</b>
Delays for Transition to Home/Shelter	No Housing - No support System	6	178	8	190	6	99	20	467
	Refractory Disease	2	13	10	259	3	77	15	349
	Family not available	8	56	4	20	3	44	15	120
	No OP treatment readily available	4	21	4	24	3	53	11	98
	No transportation for OP treatment	2	25	2	25	3	25	7	75
	Med-Psych Home Care needs	1	14	1	7			2	21
	<b>Total</b>	<b>23 (59%)</b>	<b>307 (53%)</b>	<b>29 (64%)</b>	<b>525 (68%)</b>	<b>18 (64%)</b>	<b>298 (51%)</b>	<b>70 (62%)</b>	<b>1,130 (58%)</b>
<b>Grand Total</b>	<b>39</b>	<b>577</b>	<b>45</b>	<b>775</b>	<b>28</b>	<b>580</b>	<b>112</b>	<b>1,932</b>	

Table 9: Long Stay Patients with Barrier Days: Analysis by Discharge Destination

	Discharge Destination	FY15		FY16		FY17 (10/16-3/17)		Total	
		# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days
Delays for Placement in Supervised Facilities	Supervised Living	16	355	22	349	7	277	45	981
	Crisis Stabilization Bed	2	7	2	21	5	65	9	93
	Other Psychiatry IP Service			1	20	1	27	2	47
	Residential Substance Abuse Rehab			1	6			1	6
	<b>Total</b>	<b>18 (46%)</b>	<b>362 (62%)</b>	<b>26 (58%)</b>	<b>396 (51%)</b>	<b>13 (46%)</b>	<b>369 (64%)</b>	<b>57 (51%)</b>	<b>1,127 (58%)</b>
Delays for Transition to Home/Shelter	Home - Independent	5	53	10	283	2	14	17	350
	Home - With family supervision	11	92	5	51	9	177	25	320
	Home - With Home Health Care	4	49	2	35	1	8	7	92
	Home - With Partial Hospitalization Program	1	21	1	5	3	12	5	38
	Shelter			1	5			1	5
	<b>Total</b>	<b>21 (54%)</b>	<b>215 (38%)</b>	<b>19 (42%)</b>	<b>379 (49%)</b>	<b>15 (54%)</b>	<b>211 (36%)</b>	<b>55 (49%)</b>	<b>805 (42%)</b>
<b>Grand Total</b>	<b>39</b>	<b>577</b>	<b>45</b>	<b>775</b>	<b>28</b>	<b>580</b>	<b>112</b>	<b>1,932</b>	

## Conclusions:

- Delays in discharge impact a majority (62%) of long stay psychiatry patients.
- Delays in discharge contribute to the utilization of an estimated 2 inpatient beds for non-medically necessary reasons or to the lost opportunity to treat 57 patients annually (estimated ALOS 14 days).
- Estimated costs of barrier days over the 30 month period: \$1.8M.
- 38% of long stay patients encounter no barriers to discharge. This is a reflection of 1) UVMHC inpatient psychiatry service's evolving role as a true tertiary care referral facility and 2) upward trend in treating individuals requiring medically complex nursing care on the inpatient psychiatry service.

- The number of patients with stays 30 days or longer is increasing at an annual rate of 15-20%. For FY 2017, the projected number of long stay patients is 85, an increase of 20 patients compared to FY 2015.
- Barrier Days FY 2017 data indicate an increase of 24% from FY 2016 in patients who will remain while waiting for discharge to the right facility or with the right preparations for transition to home or shelter, and 50% increase in total barrier days.
- Forecasted growth in inpatient psychiatry admissions from Sg2 show an expected increase over CY 2016 volumes of 6% by 2020, with similar growth in total days. This additional patient volume would be expected to contribute further to the impacts noted in this analysis.

### Recommendations:

- Prioritize efforts and resources on initiatives focused on facilitating placement at Supervised Living Facilities (Group Homes, SNF, Assisted Living Facilities, Court Related, Secure Residential). This would address the largest contributor to total barrier days.
  - Drill down on root causes and allocate resources to initiatives focused on addressing the need for enhanced support in transitioning to home or shelter. This would impact up to 50% of patients who experience barrier days.
  - Factor the operating assumption that at least 38% of long stay patients meet medical necessity criteria, when building predictive modeling of inpatient psychiatry bed utilization.
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## Appendix: Additional Tables

Appendix Table 1: Barriers to Discharge Ranked by Number of Patients Impacted

Barrier to Discharge Category	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Patients	Patient Distribution	# of Patients	Patient Distribution	# of Patients	Patient Distribution	# of Patients	Patient Distribution
Delay in Group Home Placement	5	13%	11	24%	7	25%	23	21%
No Housing - No support System	6	15%	8	18%	6	21%	20	18%
Family not available	8	21%	4	9%	3	11%	15	13%
Refractory Disease	2	5%	10	22%	3	11%	15	13%
Delay in SNF/ Assisted Living Placement	3	8%	5	11%	3	11%	11	10%
No OP treatment readily available	4	10%	4	9%	3	11%	11	10%
No transportation for OP treatment	2	5%	2	4%	3	11%	7	6%
Chronic High Risk of Harm to Self/Others	5	13%		0%		0%	5	4%
Court Related	3	8%		0%		0%	3	3%
Med-Psych Home Care needs	1	3%	1	2%		0%	2	2%
<b>Total</b>	<b>39</b>	<b>100%</b>	<b>45</b>	<b>100%</b>	<b>28</b>	<b>100%</b>	<b>112</b>	<b>100%</b>

Appendix Table 2: Barriers to Discharge Ranked by Total Barrier Days

Barrier to Discharge Category	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution	# of Barrier Days	Barrier Days Distribution
No Housing - No support System	178	31%	190	25%	99	17%	467	24%
Delay in Group Home Placement	40	7%	163	21%	171	29%	374	19%
Refractory Disease	13	2%	259	33%	77	13%	349	18%
Delay in SNF/ Assisted Living Placement	107	19%	87	11%	111	19%	305	16%
Family not available	56	10%	20	3%	44	8%	120	6%
No OP treatment readily available	21	4%	24	3%	53	9%	98	5%
No transportation for OP treatment	25	4%	25	3%	25	4%	75	4%
Chronic High Risk of Harm to Self/Others	65	11%		0%		0%	65	3%
Court Related	58	10%		0%		0%	58	3%
Med-Psych Home Care needs	14	2%	7	1%		0%	21	1%
<b>Total</b>	<b>577</b>	<b>100%</b>	<b>775</b>	<b>100%</b>	<b>580</b>	<b>100%</b>	<b>1,932</b>	<b>100%</b>

Appendix Table 3: Patient Count and Total Barrier Days by Discharge Destination

Discharge Destination	FY15		FY16		FY17 (10/16-3/17)		Total	
	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days	# of Patients	# of Barrier Days
Supervised Living	16	355	22	349	7	277	45	981
Home - Independent	5	53	10	283	2	14	17	350
Home - With family supervision	11	92	5	51	9	177	25	320
Crisis Stabilization Bed	2	7	2	21	5	65	9	93
Home - With Home Health Care	4	49	2	35	1	8	7	92
Home - With Partial Hospitalization Program	1	21	1	5	3	12	5	38
Other Psychiatry IP Service			1	20	1	27	2	47
Residential Substance Abuse Rehab			1	6			1	6
Shelter			1	5			1	5
<b>Total</b>	<b>39</b>	<b>577</b>	<b>45</b>	<b>775</b>	<b>28</b>	<b>580</b>	<b>112</b>	<b>1,932</b>