NUPLAZID® (pimavanserin): Healthcare resource utilization studies

Summary[1-8]

In a retrospective claims analysis of **US Medicare patients with PD psychosis**, matched patients (n=842) who initiated continuous monotherapy with pimavanserin had:

- **Significantly lower all-cause and psychiatric hospital admission rates** over 12 months compared to patients who initiated monotherapy with other atypical APs or quetiapine
- **A significantly longer time to first LTC admission vs quetiapine patients**; LTC admissions were found to be 10% lower among pimavanserin patients compared to other atypical APs and quetiapine

In a retrospective claims analysis of **US Medicare patients with newly diagnosed PD psychosis,** patients (n=694) who initiated pimavanserin monotherapy within 6 months of diagnosis had:

- **Significantly lower all-cause and psychiatric hospital admission rates** for 6 months post-pimavanserin versus pre-pimavanserin initiation

In a retrospective claims analysis of **US Medicare LTC/nursing home residents with PD psychosis**, the matched cohort of residents (n=1827) who initiated continuous monotherapy with pimavanserin had:

- **Significantly lower all-cause and psychiatric inpatient hospital admission rates** over 6 months compared to residents who initiated other atypical APs or quetiapine

In a retrospective claims analysis of **US Medicare patients with PD psychosis and co-existing dementia**, matched patients (n=1294 per cohort) who initiated continuous monotherapy with pimavanserin had:

- **Significantly lower all-cause and psychiatric inpatient hospital admission rates** over 12 months compared to patients who initiated other atypical APs or quetiapine
- **Patients on pimavanserin had a 23% lower risk of LTC admission** compared to patients on other atypical APs and those on quetiapine

These analyses should be interpreted in the context of their limitations (as shown on page 8).

Retrospective claims analyses of US Medicare patients with PD psychosis[1-3]

Objective

Retrospective cohort study conducted in Medicare beneficiaries (matched 1:1) to examine HCRU outcomes among patients with PD psychosis treated with pimavanserin (n=842) compared with other atypical APs (n=8810) or quetiapine (n=7116) from January 1, 2013 to December 31, 2019

Study population

Patients with PD psychosis initiating (ie, index date) continuous monotherapy of pimavanserin or other atypical APs (aripiprazole, risperidone, quetiapine, olanzapine) for ≥12 months during January 2014 to December 2018 without any prior atypical AP use during the 12-month pre-index period

Outcomes

- All-cause and psychiatric-related hospitalizations and visits for 12 months, including inpatient hospitalization rates, ER visits, outpatient visits, and office visits
- Time to LTC admission (composite of SNF and LTC stays)
- Risk of all-cause LTC admission, SNF stay, and LTC stay (for comparison of pimavanserin to quetiapine only)

All-cause and psychiatric-related hospitalizations and visits in PD psychosis patients (pimavanserin vs other atypical APs)

n (%)	Pimavanserin (N=842)	Other atypical APs (N=842)	p-value
All-cause			
Any hospitalization	319 (37.8)	420 (49.8)	**<0.0001**
Short-term stay	286 (34.0)	389 (46.2)	**<0.0001**
Long-term stay	52 (6.2)	57 (6.8)	0.3828
SNF stay	170 (20.2)	267 (31.8)	**<0.0001**
Outpatient visit	777 (92.2)	776 (92.2)	>0.9
Office visit	814 (96.6)	783 (93.0)	0.0009
ER visit	519 (61.6)	584 (69.4)	**0.001**
Psychiatric-related			
Any hospitalization	81 (9.6)	123 (14.6)	**<0.0001**
Short-term stay	46 (5.4)	80 (9.6)	**0.0022**
Long-term stay	*	*	--
SNF stay	40 (4.8)	52 (6.2)	0.2382
Outpatient visit	154 (18.2)	182 (21.6)	0.09
Office visit	494 (58.6)	269 (32.0)	<0.0001
ER visit	43 (5.2)	86 (10.2)	**0.0001**

*Cells with sample size of <11 are suppressed per CMS requirements.

Pimavanserin patients had significantly lower all-cause hospital admission rates, short-term stays, SNF stays, and ER visits compared to patients receiving other atypical APs

Pimavanserin patients had significantly lower psychiatric hospital admission rates, short-term stays, and ER visits compared to patients receiving other atypical APs

Retrospective claims analyses of US Medicare patients with PD psychosis (cont'd)[1-3]

All-cause and psychiatric-related hospitalizations and visits in PD psychosis patients (pimavanserin vs quetiapine)

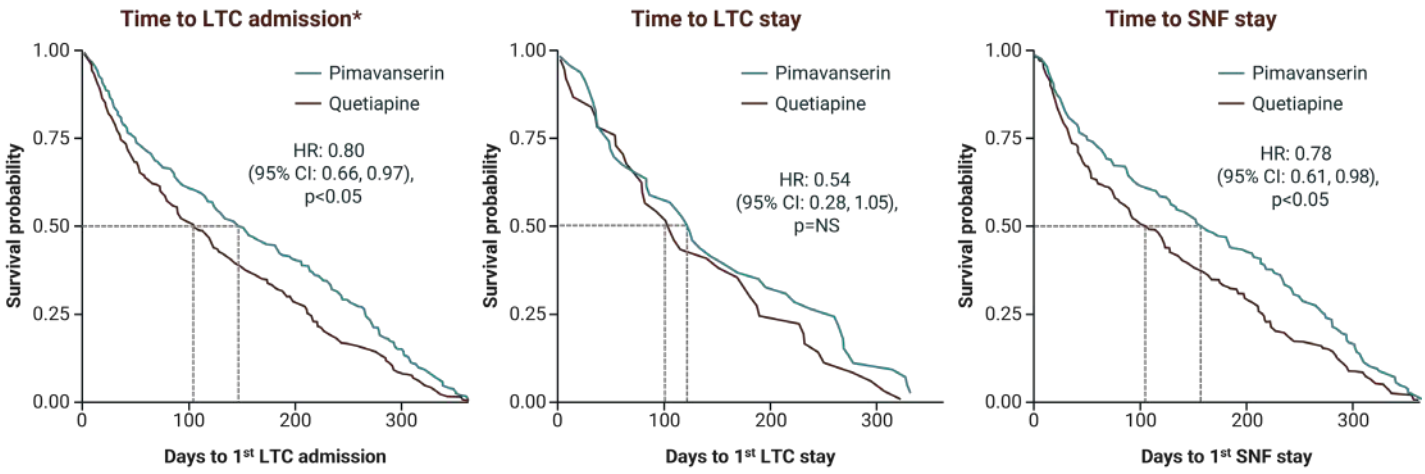
n (%)	Pimavanserin (N=842)	Quetiapine (N=842)	RR (95%)	p-value
All-cause				
Any hospitalization	319 (37.8)	410 (48.6)	0.78 (0.70–0.87)	**<0.05**
Short-term stay	286 (34.0)	383 (45.5)	0.75 (0.66–0.84)	**<0.05**
Long-term stay	52 (6.2)	47 (5.6)	1.11 (0.75–1.62)	NS
SNF stay	170 (20.2)	265 (31.5)	0.64 (0.54–0.76)	**<0.05**
Outpatient visit	777 (92.2)	766 (91.0)	1.01 (0.99–1.04)	NS
Office visit	814 (96.6)	793 (94.2)	1.03 (1.01–1.05)	<0.05
ER visit	519 (61.6)	572 (68.0)	0.91 (0.84–0.97)	**<0.05**
Psychiatric-related				
Any hospitalization	81 (9.6)	129 (15.4)	0.63 (0.48–0.82)	**<0.05**
Short-term stay	46 (5.4)	76 (9.0)	0.61 (0.43–0.86)	**<0.05**
Long-term stay	11 (1.4)	11 (1.4)	1.00 (0.44–2.29)	NS
SNF stay	40 (4.8)	58 (6.8)	0.69 (0.47–1.02)	NS
Outpatient visit	154 (18.2)	186 (22.0)	0.83 (0.68–1.00)	NS
Office visit	494 (58.6)	285 (33.8)	1.73 (1.55–1.94)	<0.05
ER visit	43 (5.2)	81 (9.6)	0.53 (0.37, 0.76)	**<0.05**

Pimavanserin patients had significantly lower all-cause hospital admission rates, lower relative risk for any hospitalization, short-term stays, SNF stays, and ER visits compared to patients receiving quetiapine

Pimavanserin patients had significantly lower psychiatric hospital admission rates, lower relative risk for any hospitalization, short-term stays, and ER visits compared to patients receiving quetiapine

LTC admission, defined as a composite of LTC stay or SNF stay, **was found to be 10% lower among pimavanserin patients compared to other atypical APs** (23.2% vs 34.6%; *p*<0.05) **and quetiapine** (23.2% vs 33.8%; *p*<0.05)

Kaplan-Meier survivor curves of time to LTC admission in PD psychosis patients (pimavanserin vs quetiapine)*



*LTC admission was a composite of SNF and LTC stays.

A longer time to first LTC admission was observed among pimavanserin patients vs quetiapine: median (IQR) time to first LTC admission was 149 (49–267) days vs 105 (35–213) days for pimavanserin and quetiapine patients, respectively (*p*<0.05)

Retrospective claims analysis of US Medicare patients with newly diagnosed PD psychosis[4]

Objective

Retrospective pre-post analysis conducted in Medicare beneficiaries to examine HCRU outcomes among patients with newly diagnosed PD psychosis who initiated pimavanserin monotherapy (n=694) within 6 months of diagnosis from April 1, 2015 to December 31, 2021

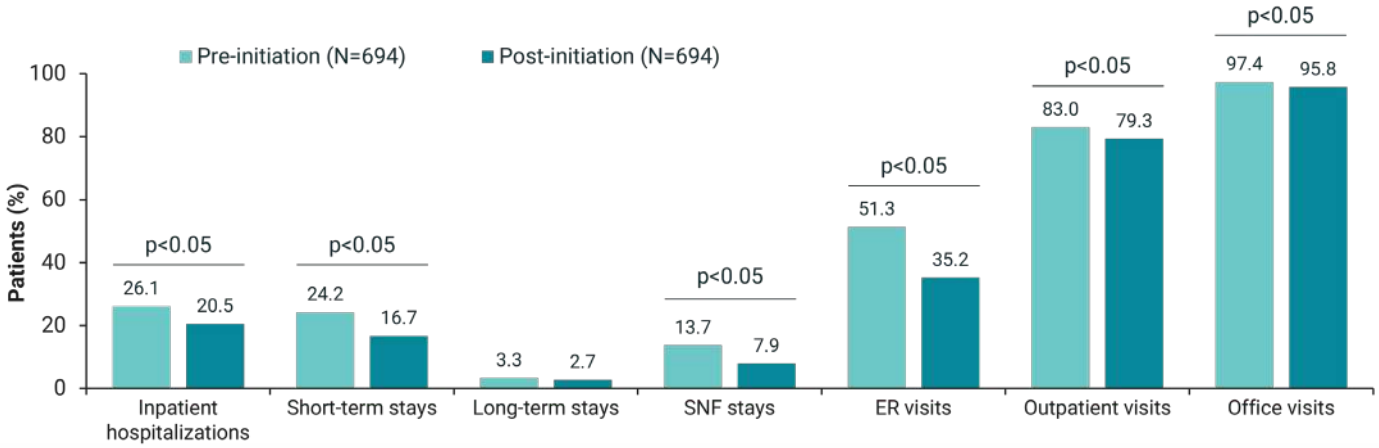
Study population

Patients with newly diagnosed PD psychosis initiating (ie, index date) pimavanserin monotherapy within 6 months of diagnosis for ≥6 months during April 2016 to December 2020 without any prior AP use during the 12-month pre-index period

Outcomes

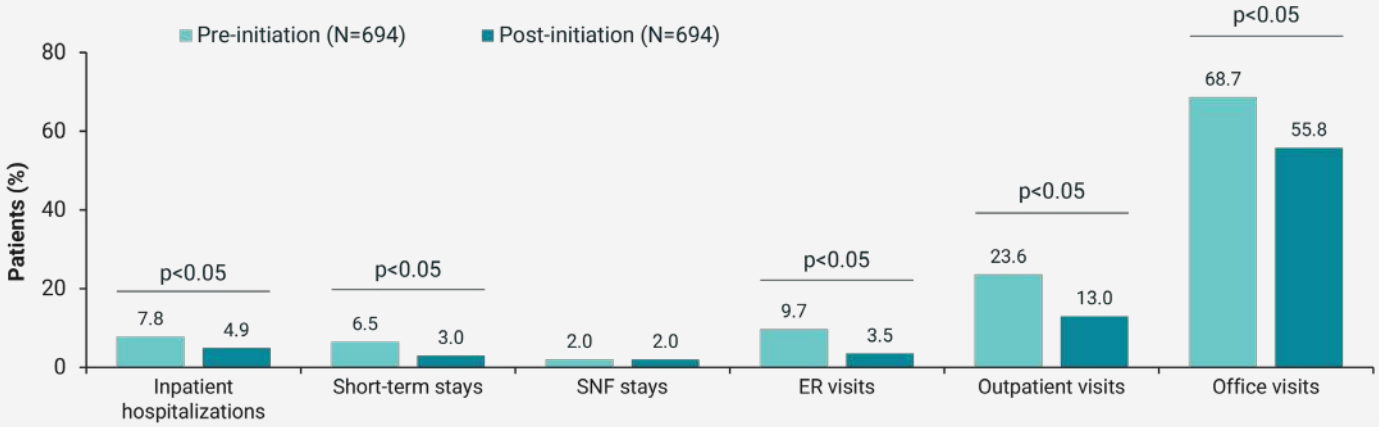
All-cause and psychiatric-related hospitalizations, including inpatient hospitalization rates, ER visits, outpatient visits, and office visits, for 6 months pre- and post-initiation of pimavanserin

All-cause hospitalizations and visits in newly diagnosed PD psychosis patients who initiated pimavanserin within 6 months of diagnosis



All-cause inpatient hospitalizations, short-term stays, SNF stays, ER visits, outpatient visits, and office visits were significantly lower in the 6-month period after pimavanserin initiation compared with the 6-month period before initiation

Psychiatric hospitalizations and visits in newly diagnosed PD psychosis patients who initiated pimavanserin within 6 months of diagnosis



Psychiatric inpatient hospitalizations, short-term stays, ER visits, outpatient visits, and office visits were significantly lower in the 6-month period after pimavanserin initiation compared with the 6-month period before initiation

Retrospective claims analyses of US Medicare nursing home residents with PD psychosis[5]

Objective

Retrospective cohort study conducted in Medicare beneficiaries (matched 1:1) to examine HCRU outcomes among LTC/nursing home residents with PD psychosis treated with pimavanserin (n=1827) compared with quetiapine (n=7770) or other atypical APs (n=9557) from April 2015 to December 2021

Study population

LTC/nursing home residents with PD psychosis initiating (ie, index date) continuous monotherapy of pimavanserin or other atypical APs (aripiprazole, risperidone, quetiapine, olanzapine) for ≥6 months during April 2016 to June 2021 without any prior atypical AP use during the 12-month pre-index period

Outcomes

All-cause and psychiatric-related hospitalizations and visits for 6 months, including inpatient hospitalization rates, SNF stays, and ER visits

All-cause HCRU in matched LTC/nursing home residents at 6 months (pimavanserin vs quetiapine)

	Residents (%)		
	PIM	QUE	Relative risk (95% CI)
Any inpatient hospitalization	29.8%	36.7%	0.82 (0.75, 0.90)
Short-term stay	25.5%	32.3%	0.80 (0.72, 0.88)
Long-term stay	4.4%	6.2%	0.71 (0.53, 0.93)
SNF stay	17.3%	22.6%	0.79 (0.69, 0.90)
ER visits	47.3%	55.8%	0.85 (0.80, 0.90)

Compared to quetiapine, residents receiving pimavanserin exhibited **significantly lower risk** for the following all-cause outcomes: **any inpatient hospitalizations, short-term stays, SNF stays, long-term stays, and ER visits**

Psychiatric-related HCRU in matched LTC/nursing home residents at 6 months (pimavanserin vs quetiapine)

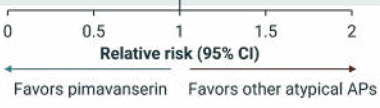
	Residents (%)		
	PIM	QUE	Relative risk (95% CI)
Any inpatient hospitalization	8.8%	12.6%	0.71 (0.58, 0.85)
Short-term stay	4.2%	6.7%	0.62 (0.47, 0.82)
Long-term stay	1.0%	1.6%	0.58 (0.33, 1.04)
SNF stay	5.0%	6.2%	0.83 (0.63, 1.09)
ER visits	4.1%	7.8%	0.52 (0.39, 0.68)

Compared with quetiapine, residents receiving pimavanserin monotherapy exhibited **significantly lower risk** for the following psychiatric-related outcomes: **inpatient hospitalizations, short-term stays, and ER visits**

All-cause HCRU in matched LTC/nursing home residents at 6 months (pimavanserin vs other atypical APs)

	Residents (%)	
	PIM	Other atypical APs
Any inpatient hospitalization	29.8%	37.7%
Short-term stay	25.5%	32.1%
Long-term stay	4.4%	6.6%
SNF stay	17.3%	23.0%
ER visits	47.3%	55.5%

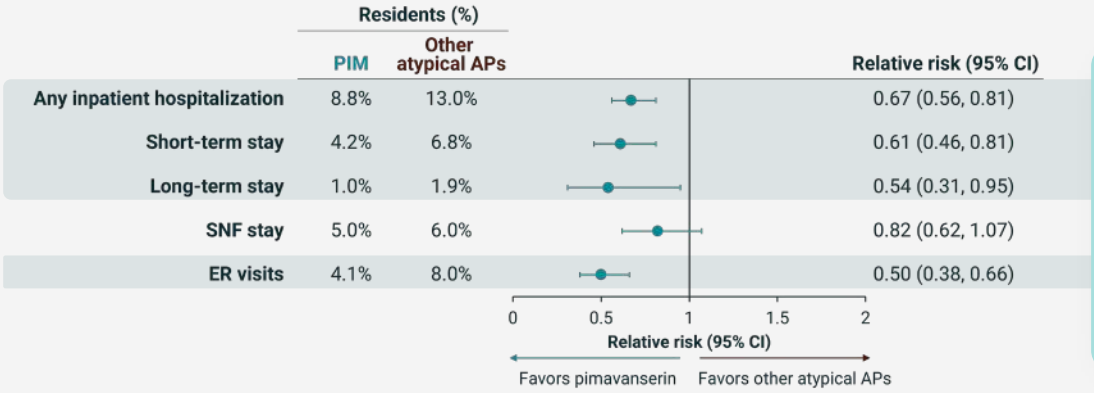
Relative risk (95% CI)
0.78 (0.71, 0.86)
0.80 (0.72, 0.88)
0.66 (0.50, 0.87)
0.75 (0.66, 0.86)
0.85 (0.79, 0.90)



Compared to other atypical APs, residents receiving pimavanserin exhibited **significantly lower risk** for the following all-cause outcomes: **any inpatient hospitalizations, short-term stays, long-term stays, SNF stays, and ER visits**

Retrospective claims analyses of US Medicare nursing home residents with PD psychosis (cont'd)[5]

Psychiatric-related HCRU in matched LTC/nursing home residents at 6 months (pimavanserin vs other atypical APs)



Compared with other atypical APs, residents receiving pimavanserin monotherapy exhibited **significantly lower risk** for the following psychiatric-related outcomes: **inpatient hospitalizations, short-term stays, long-term stays, and ER visits**

Retrospective claims analyses of US Medicare patients with PD psychosis and co-existing dementia[6-8]

Objective

Retrospective cohort study conducted in Medicare beneficiaries (matched 1:1) to examine HCRU outcomes among patients with PD psychosis and co-existing dementia treated with pimavanserin (n=1294) compared with other atypical APs (n=4638) or quetiapine (n=4131) from April 1, 2015 to December 31, 2021

Study population

Patients with PD psychosis and co-existing dementia initiating (ie, index date) continuous monotherapy of pimavanserin or other atypical APs (aripiprazole, risperidone, quetiapine, olanzapine) for ≥12 months during April 1, 2016 to December 31, 2020 without any prior atypical AP use during the 12-month pre-index period

Outcomes

- All-cause and psychiatric-related hospitalizations for 12 months, including inpatient hospitalization rates, ER visits, and outpatient and office visits
- Time to all-cause LTC admission (composite of SNF and LTC stays)

All-cause and psychiatric-related hospitalizations and visits in patients with PD psychosis and co-existing dementia (pimavanserin vs other atypical APs)

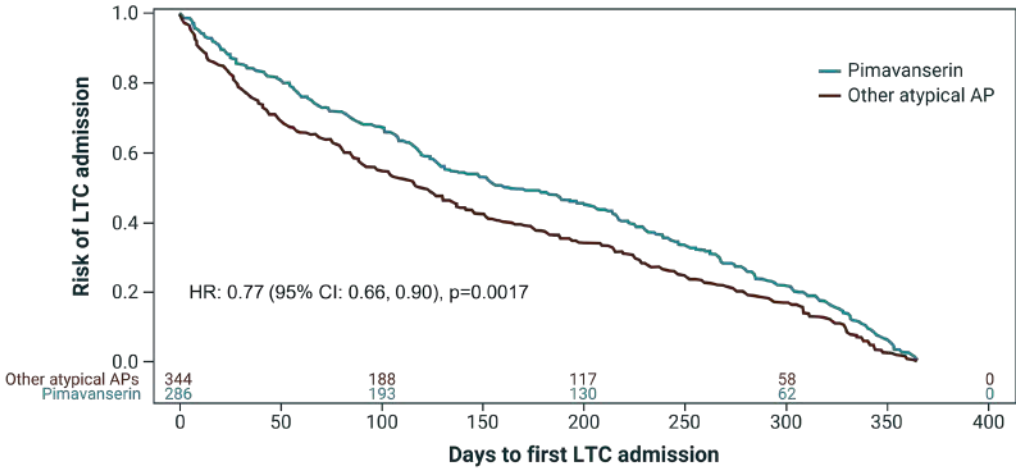
%	Pimavanserin (N=1294)	Other atypical APs (N=1294)	RR (95%)	*p*-value
All-cause				
Inpatient hospitalization	37.6	42.4	0.88 (0.80, 0.97)	**0.0104**
Short-term stay	33.2	38.8	0.86 (0.77, 0.95)	**0.0034**
Long-term stay	5.6	5.3	1.07 (0.77, 1.49)	0.6720
SNF stay	19.2	24.4	0.79 (0.68, 0.92)	**0.0024**
Outpatient visit	90.6	92.1	0.99 (0.96, 1.01)	0.2436
ER visit	60.1	79.9	0.89 (0.84, 0.94)	**<0.0001**
Office visit	96.2	67.8	1.16 (1.13, 1.21)	<0.0001
Psychiatric-related				
Inpatient hospitalization	11.3	15.8	0.71 (0.58, 0.87)	**0.0009**
Short-term stay	6.2	9.3	0.66 (0.50, 0.87)	**0.0032**
Long-term stay	0.9	1.1	0.91 (0.41, 2.03)	0.8203
SNF stay	5.6	8.1	0.69 (0.51, 0.92)	**0.0118**
Outpatient visit	19.9	28.7	0.69 (0.60, 0.79)	**<0.0001**
ER visit	6.1	11.6	0.54 (0.41, 0.70)	**<0.0001**
Office visit	53.8	38.5	1.39 (1.28, 1.52)	<0.0001

Beneficiaries receiving pimavanserin had **significantly lower risk** for the following all-cause outcomes: **any inpatient hospitalizations, short-term stays, SNF stays, and ER visits**

Beneficiaries receiving pimavanserin monotherapy had **significantly lower risk** for the following psychiatric-related outcomes: **inpatient hospitalizations, short-term stays, SNF stays, outpatient visits, and ER visits**

Retrospective claims analyses of US Medicare patients with PD psychosis and co-existing dementia (cont'd)[6-8]

Time to LTC admissions in patients with PD psychosis and co-existing dementia (pimavanserin vs other atypical APs)*



Patients on pimavanserin had a 23% lower risk of LTC admission compared to patients on other atypical APs

*LTC admission was a composite of SNF and LTC stays.

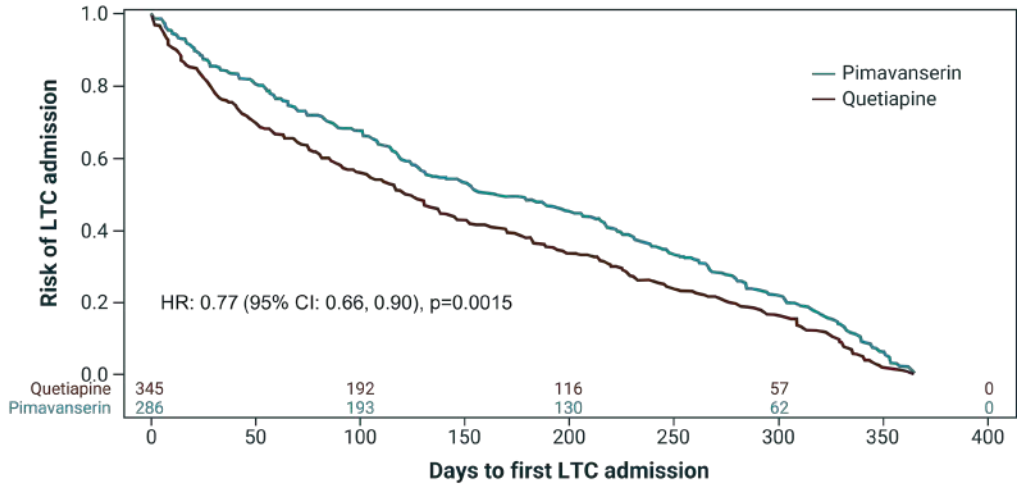
All-cause and psychiatric-related hospitalizations and visits in patients with PD psychosis and co-existing dementia (pimavanserin vs quetiapine)

%	Pimavanserin (N=1294)	Quetiapine (N=1294)	RR (95%)	*p*-value
All-cause				
Inpatient hospitalization	38	43	0.88 (0.80, 0.96)	**0.0063**
Short-term stay	33	39	0.85 (0.77, 0.95)	**0.0028**
Long-term stay	6	6	0.96 (0.70, 1.31)	0.7944
SNF stay	19	24	0.81 (0.70, 0.94)	**0.0049**
Outpatient visit	91	92	0.99 (0.96, 1.01)	0.3215
ER visit	60	68	0.88 (0.83, 0.94)	**<0.0001**
Office visit	96	95	1.02 (1.00, 1.04)	0.0257
Psychiatric-related				
Inpatient hospitalization	11	16	0.70 (0.57, 0.85)	**0.0004**
Short-term stay	6	10	0.65 (0.50, 0.86)	**0.0022**
Long-term stay	1	2	0.54 (0.26, 1.11)	0.0928
SNF stay	6	8	0.68 (0.51, 0.91)	**0.0093**
Outpatient visit	20	28	0.70 (0.61, 0.80)	**<0.0001**
ER visit	6	12	0.53 (0.41, 0.69)	**<0.0001**
Office visit	54	44	1.22 (1.12, 1.32)	<0.0001

Beneficiaries on pimavanserin exhibited **significantly lower risk** for the following all-cause outcomes: **any inpatient hospitalizations, short-term stays, SNF stays, and ER visits**

Patients receiving pimavanserin monotherapy demonstrated **significantly lower risk** for the following psychiatric-related outcomes: **inpatient hospitalizations, short-term stays, SNF stays, outpatient visits, and ER visits**

Time to LTC admissions in patients with PD psychosis and co-existing dementia (pimavanserin vs quetiapine)*



Patients on pimavanserin had a 23% lower risk of LTC admission compared to patients on quetiapine

*LTC admission was a composite of SNF and LTC stays.

Limitations

The studies included in this resource have limitations that are common to administrative claims database analyses. With any retrospective observational study design, causality cannot be inferred. Administrative claims data may contain coding errors, missed claims, bias introduced by omission of variables, and these should be considered as limitations to these data. The *p*-values included show the statistical significance or lack thereof of observed rates of health resource use outcomes analyzed between two treatment groups. Causality or superiority of a particular treatment cannot be established with any analysis of observational data. As there is no diagnostic code for PD psychosis, identification of psychosis was based on a diagnosis of psychosis-related hallucinations and delusions, so it is likely that PD psychosis diagnosis is underestimated. While the study addressed potential confounding issues through appropriate matching and covariate adjustment, residual confounding may exist. PD–specific measures of severity were not evaluated; however, matching residents and setting the criteria for PD psychosis helped alleviate this to create matched populations at baseline.

Definitions of outcomes[1,2]

In Medicare claims, inpatient hospitalizations can be further classified into 3 different types of admissions:

- Short-term stays: hospitalizations of ≤25 days that occur in hospitals where patients require an acute or critical setting following surgery, sudden sickness, or flare up of a chronic sickness.
- Long-term stays: hospitalizations in certified long-term acute care hospitals who would be expected to stay for >25 days. Patients are typically transferred from intensive care units to long-term acute care.
- SNF stays: hospitalizations that extend beyond the duration of long-term stays. Patients in SNFs may receive care for up to 100 days, focusing on skilled nursing services and rehabilitation.

Abbreviations

AP=antipsychotic; CI=confidence interval; CMS=Centers for Medicare and Medicaid Services; ER=emergency room; HCRU=healthcare resource utilization; HR=hazard ratio; IQR=interquartile range; LTC=long term care; NS=not significant; PD=Parkinson's disease; PIM=pimavanserin; QUE=quetiapine; RR=relative risk; SD=standard deviation; SNF=skilled nursing facility; US=United States.

References

1. Rajagopalan K, Rashid N, Kumar S, Doshi D. Health care resource utilization patterns among patients with Parkinson's disease psychosis: analysis of Medicare beneficiaries treated with pimavanserin or other-atypical antipsychotics. *J Med Econ.* 2023;26(1):34-42. [PubMed]
2. Rajagopalan K, Rashid N, Doshi D. Patients treated with pimavanserin or quetiapine for Parkinson's disease psychosis: analysis of health resource utilization patterns among Medicare beneficiaries. *J Med Econ.* 2023;26(1):769-776. [PubMed]
3. Rajagopalan K, Rashid N, Doshi D. Risk of long-term care admissions among Medicare beneficiaries treated with pimavanserin or quetiapine for Parkinson's disease psychosis in USA: a retrospective administrative claims database analysis. *J Comp Eff Res.* 2024;13(1):e230114. [PubMed]
4. Rashid N, et al. Impact of early treatment with pimavanserin on healthcare resource utilization among newly diagnosed patients With Parkinson's disease psychosis: A pre-post Medicare claims database analysis. *J Health Econ Outcomes Res*. 2026;13(1):1-9. doi: 10.36469/001c.154805. [PubMed]
5. Rajagopalan K, Rashid N, Gopal D, Doshi D. Healthcare resource utilization among nursing home residents with Parkinson's disease psychosis: an analysis of Medicare beneficiaries treated with pimavanserin or other-atypical antipsychotics. *J Comp Eff Res*. 2024;13(7):e240038. [PubMed]
6. Rashid N, et al. Patients with Parkinson's disease psychosis and dementia: analysis of healthcare resource utilization and time to long term care admission among US Medicare beneficiaries initiating pimavanserin versus other-atypical antipsychotics. Poster presented at Annual Meeting of the Parkinson Study Group (PSG); December 5-8, 2024. Nashville, TN.
7. Rashid N, et al. Healthcare resource utilization and time to long term care admission among patients with Parkinson's disease psychosis with co-existing dementia initiated on pimavanserin vs quetiapine: analysis of US Medicare beneficiaries. Poster presented at US Psychiatric and Mental Health Congress 2024; October 29-November 2, 2024. Boston, MA.
8. Rajagopalan K, Gopal D, Chrones L, Doshi D, Rashid N. Healthcare resource utilization patterns among patients with Parkinson's disease psychosis and dementia: analysis of US Medicare beneficiaries treated with pimavanserin versus other-atypical antipsychotics or versus quetiapine. *J Med Econ.* 2025;28(1):556-566. [PubMed]

Pimavanserin is approved by the US Food and Drug Administration as an atypical antipsychotic indicated for the treatment of hallucinations and delusions associated with Parkinson's disease psychosis and carries a **Boxed WARNING** for Increased Mortality in Elderly Patients with Dementia-Related Psychosis. Pimavanserin is not approved for the treatment of patients with dementia who experience psychosis unless their hallucinations and delusions are related to PD.