

High Adherence and Cost Savings with Home OPAT Provided through Infectious Disease Physician Office Infusion Centers

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Abstract

Background: Outpatient parenteral antimicrobial therapy (OPAT) has been shown to be safe and effective for self-administration but can lead to non-adherence without supervision. A physician office infusion center (POIC) with pharmacy services provides a unique opportunity to impact adherence and OPAT management. Patients (pts) typically come to the POIC weekly for catheter care, laboratory collection, medication pick-up and as needed provider visits. Often, close provider oversight allows for de-escalation of OPAT. We evaluated adherence to therapy, visits and associated cost saving in pts receiving self-administered OPAT through POICs.

Methods: Pts receiving home OPAT in 2021 were randomly selected from participating sites based on annual pt volume. Adherence was assessed as % of OPAT doses dispensed vs. doses missed. Frequency of office visits for routine POICs Centers catheter care and labs along with OPAT completion were collected. Cost savings were calculated in days of OPAT saved due to therapy de-escalation and response to therapy, based upon published daily costs of OPAT. Pt characteristics, OPAT duration, infection type and regimen were captured.

Results: A total of 125/2180 pts from 13 POICs nationally were included (mean age 50±18 years, 52% male). Mean OPAT duration was 38±9 days. Predominant infections were bone and joint (38%), complicated skin (18%) intra-abdominal (15%) and bacteremia (14%). The most common antimicrobials were cephalosporins (54%) with 21 pts self-administering ≥2 drugs. Pts had a mean of 6±3 POIC visits during the therapy course with completion as scheduled in 703/706 visits (99.6%). OPAT was completed as planned in 118 pts (94%), with discontinuations for adverse events (n=3), hospitalization (n=2), or non-adherence (n=2). Overall adherence rate was 99.3% with 51 missed of 7315 doses dispensed. De-escalation during OPAT saved 533 doses equating to 307 days of OPAT (2.4 days/pt). Based on an average daily OPAT cost of \$140, this saved \$42,980 in the randomized cohort and an estimated \$749,571 annually in the entire population.

Conclusion: Home OPAT through an ID POIC was associated with a very high rate of adherence and compliance to scheduled visits in pts. ID oversight resulted in healthcare cost savings through onsite antimicrobial stewardship and therapy management.

Background

Patient (pt) adherence to a prescribed plan of care is crucial for therapy success, especially when prescribing intravenous antibiotics (IVABs) in the outpatient setting.¹ A recent study of patient reported OPAT adherence showed 10% non-adherence to the dosing regimen when provided through home infusion services, with missed visits frequently reported.² OPAT provided through a POIC with pharmacy services allows pts to receive IVABs outside of a hospital, but still under close supervision of the treating Infectious Disease (ID) physician and care of skilled infusion nurses and pharmacists.³ Data on adherence of pts self-administering IVABs at home (home OPAT) through POIC management is needed.

This study aims to quantify adherence to scheduled appointments, IVAB dose adherence and associated cost savings in pts receiving home OPAT through ID POICs.

Methods

Study design: Retrospective, observational, multicenter study of pts who received home OPAT during 2021 at participating POICs (n=13)

Study cohort: 5% of pts per POIC were randomly selected from the centralized database

Data collection: Demographics, infection types, IVAB home usage, OPAT regimen by infection type, POIC visit adherence, IVAB doses prescribed vs. dispensed with OPAT outcome defined as OPAT completion, premature discontinuations, and pt non-adherence.

Data analysis: Adherence to home OPAT was assessed for scheduled POIC visits and prescribed IVAB doses:

$$\text{Visit Adherence (\%)} = \frac{\text{No. of performed visits}}{\text{Total no. of scheduled visits}} \times 100\%$$

$$\text{Dose Adherence (\%)} = \frac{\text{No. of administered doses}}{\text{Total no. of prescribed doses}} \times 100\%$$

Cost savings were calculated based on the no. of IVAB doses initially prescribed but not needed due to favorable clinical response assessed by the treating ID physician. This was further calculated as OPAT days saved with an estimated daily cost of OPAT (\$140 USD) obtained from published national average estimates.^{4, 5} Data are presented using descriptive statistics (mean, median, frequencies).

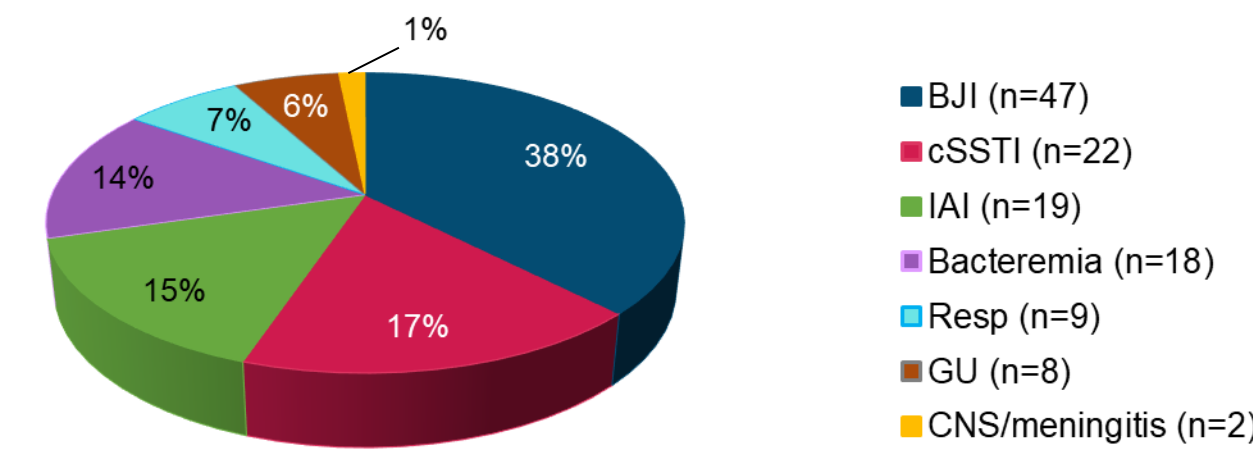
Study Cohort

- 125 of 2180 pts from 13 POICs were randomly selected who received OPAT through self-administration at home

Demographics

Variable	Results (N=125)
Age in years (mean ± SD)	50 ± 18
≤ 21	3 (2%)
22 to 64	110 (88%)
≥ 65	12 (10%)
Gender	
male	65 (52%)
female	60 (48%)

Infection Types

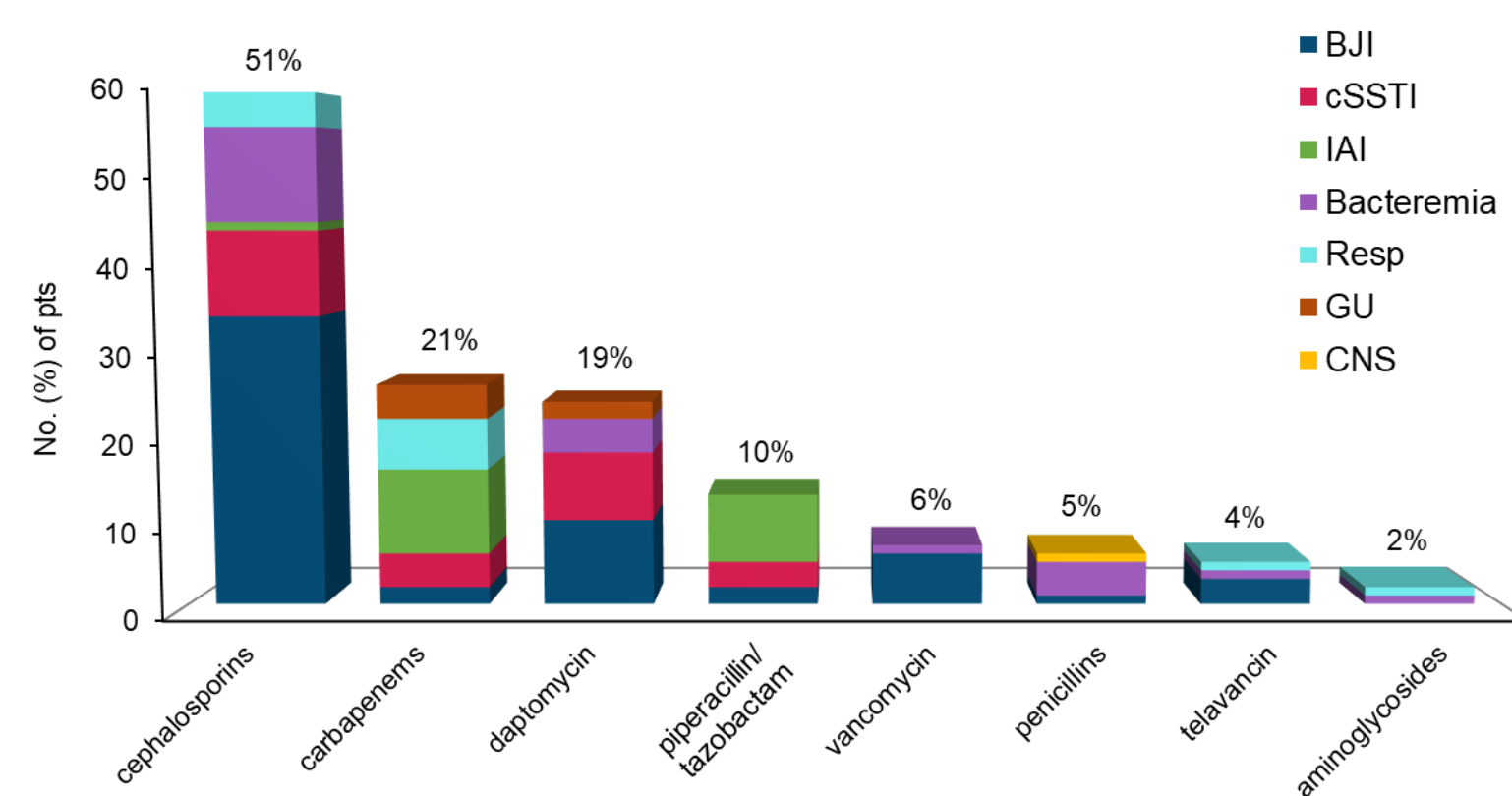


Abbreviations: BJI: bone and joint infection; cSSTI: complicated skin and skin structure infection; IAI: intra-abdominal infection; Resp: respiratory infection; GU: genitourinary infection; CNS: central nervous system infection.

- BJI, cSSTI, and IAI were the most frequent infection types among the study cohort accounting for 70% of all infection types

IVAB Home Usage

IVAB by Infection Type



- Cephalosporins (ceftriaxone, cefepime, cefazolin) were most frequently used (51%) followed by carbapenems (21%) and daptomycin (19%)
- 21 pts (17%) self-administered ≥2 IVABs during their OPAT course (10 BJI, 4 bacteremia, 3 cSSTI, 3 Resp, 1 GU)

Results

OPAT Regimen

IVAB Dosing Frequency & Therapy Duration

Infection Type	Pts (n)	IVAB Dosing Frequency					OPAT Duration in days (mean ± SD)
		q8h	q12h	q24h	q72h	cont.	
BJI	47	16	10	21			36 ± 16
cSSTI	22	5		16		1	20 ± 9
IAI	19	10		9			16 ± 7
Bacteremia	18	3	2	11	1	1	24 ± 13
Resp	9	4	2	3			28 ± 11
GU	8	1	1	6			18 ± 7
CNS	2			1			22 ± 9
Total	125	40 (32%)	15 (12%)	67 (53%)	1 (1%)	2 (2%)	38 ± 9

- Pts administered home IVABs most commonly q24h (53%), followed by q8h (32%)
- Overall mean duration of OPAT was 38 ± 9 days, driven primarily by a longer length of therapy for BJI pts

POIC Visits

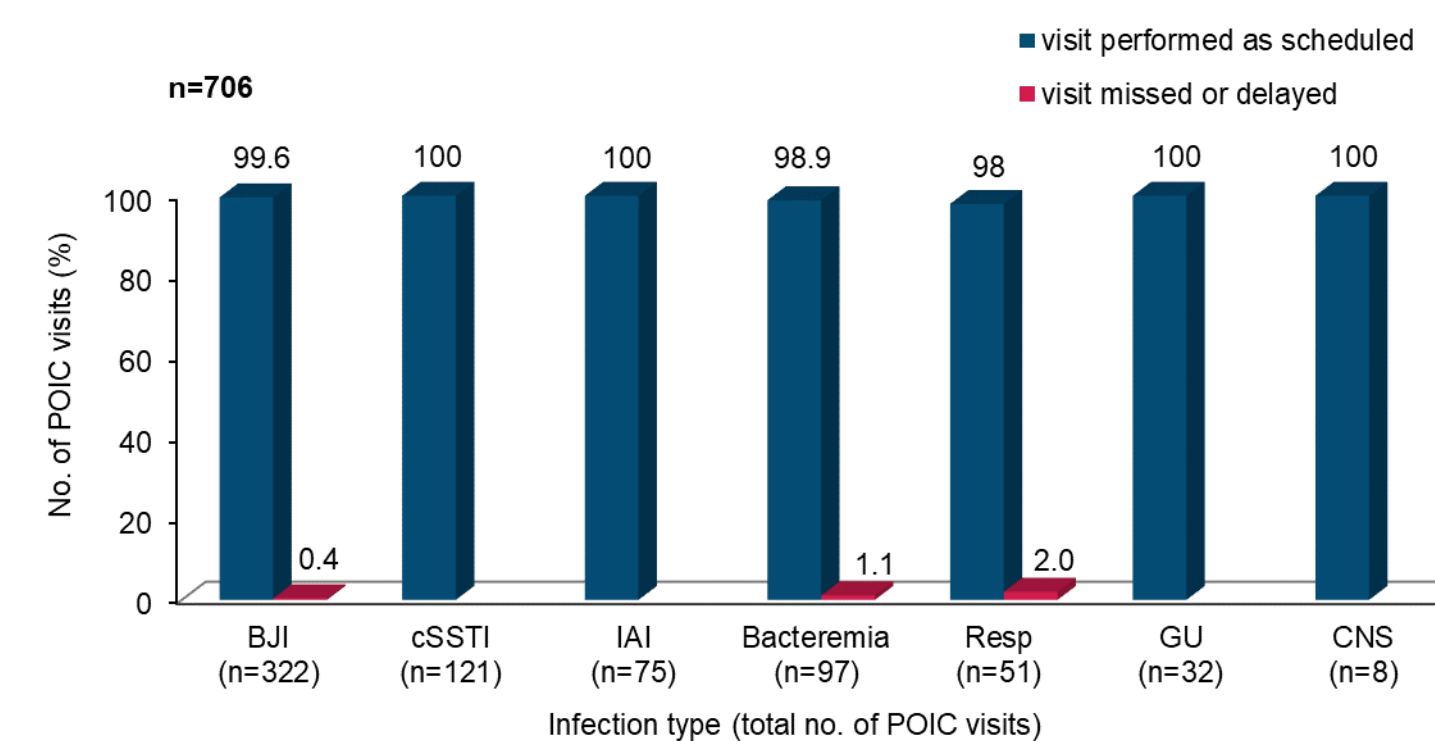
- Pts receiving home OPAT visited the POIC weekly for:
 - medication pick-up
 - catheter care
 - laboratory monitoring
 - clinical evaluation by ID physician, as needed

Visit Frequency by Infection Type

POIC Visits	BJI	cSSTI	GUI	RTI	IAI	Bacteremia	CNS	Total
Total	322	121	32	51	75	97	8	706
Visit frequency in days (mean ± SD)	6 ± 2	6 ± 2	6 ± 2	6 ± 3	6 ± 2	6 ± 2	7 ± 1	6 ± 2

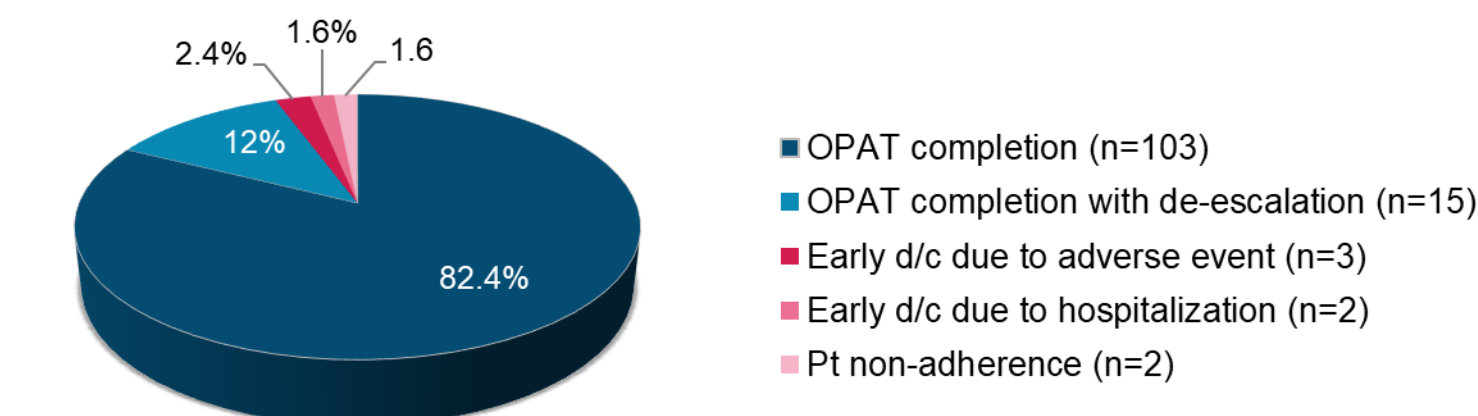
- On average, pt visits were completed every 6±2 days per OPAT course

POIC Visit Adherence



- Pts had a mean 6±3 POIC visits during the therapy with a visit adherence rate = 99.6% (703/706)
- Of the 3 non-adherent visits, 2 were delayed by 2 days and 1 was missed due to hospitalization

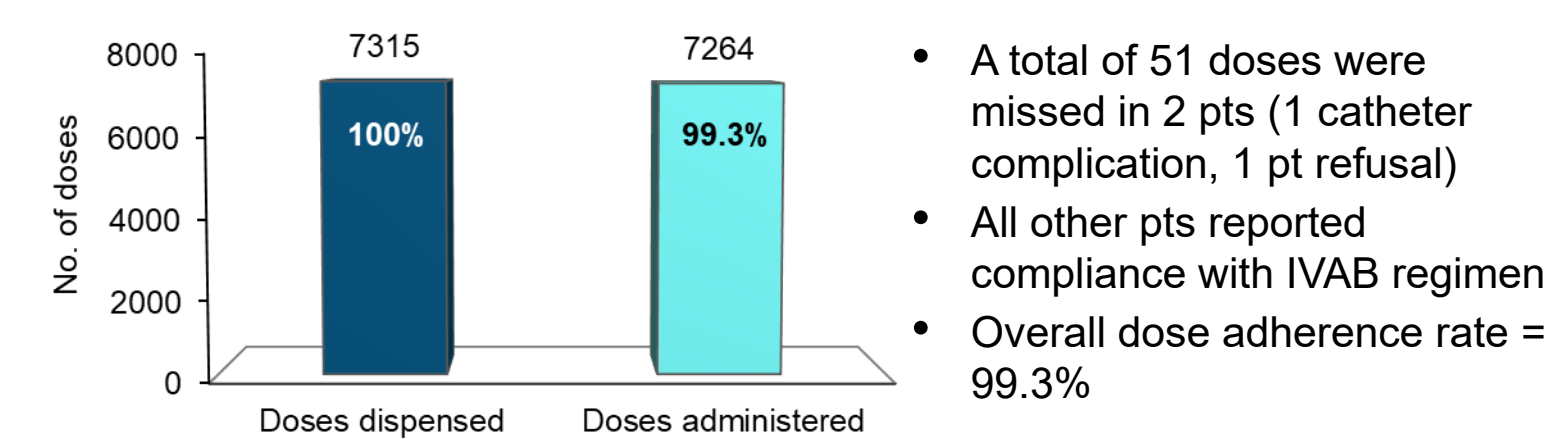
OPAT Completion



OPAT was completed in 118 pts (94.4%)

- 103 (82.4%) completed the prescribed course
- 15 (12%) completed with de-escalation due to clinical improvement
- A total of 5 pts (4% discontinued prematurely due to adverse events (n=3) and unplanned hospitalizations (n=2)
- Non-adherence occurred in 2 pts (1.6%) refusing continued OPAT

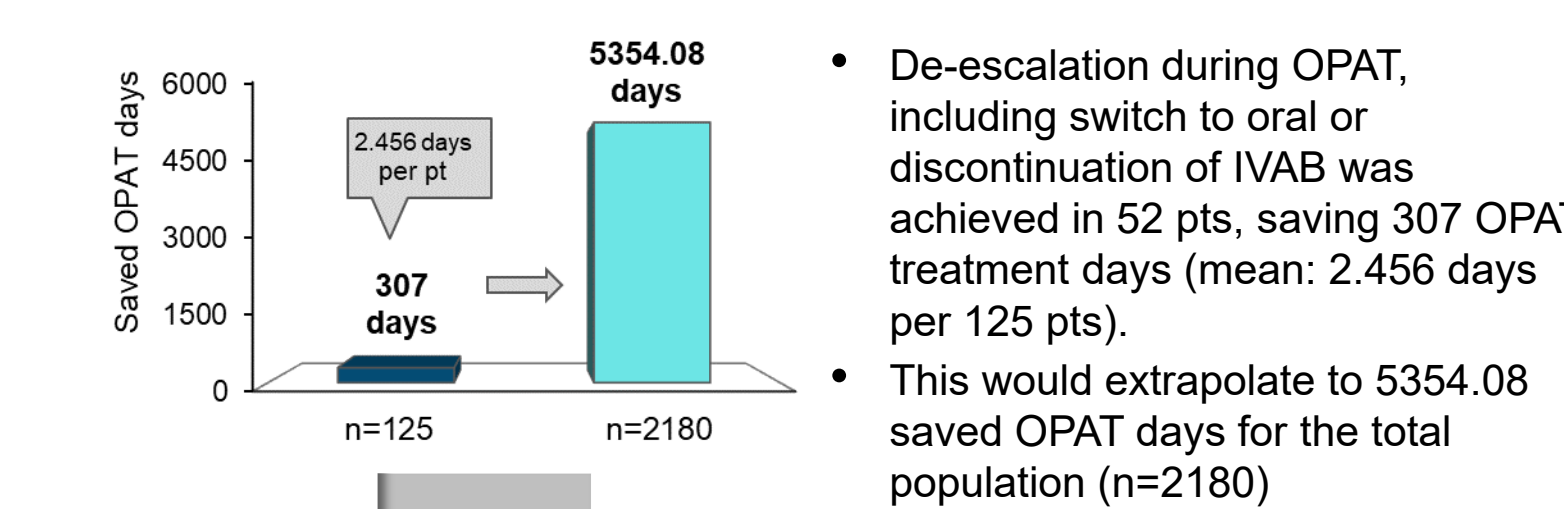
IVAB Dose Adherence



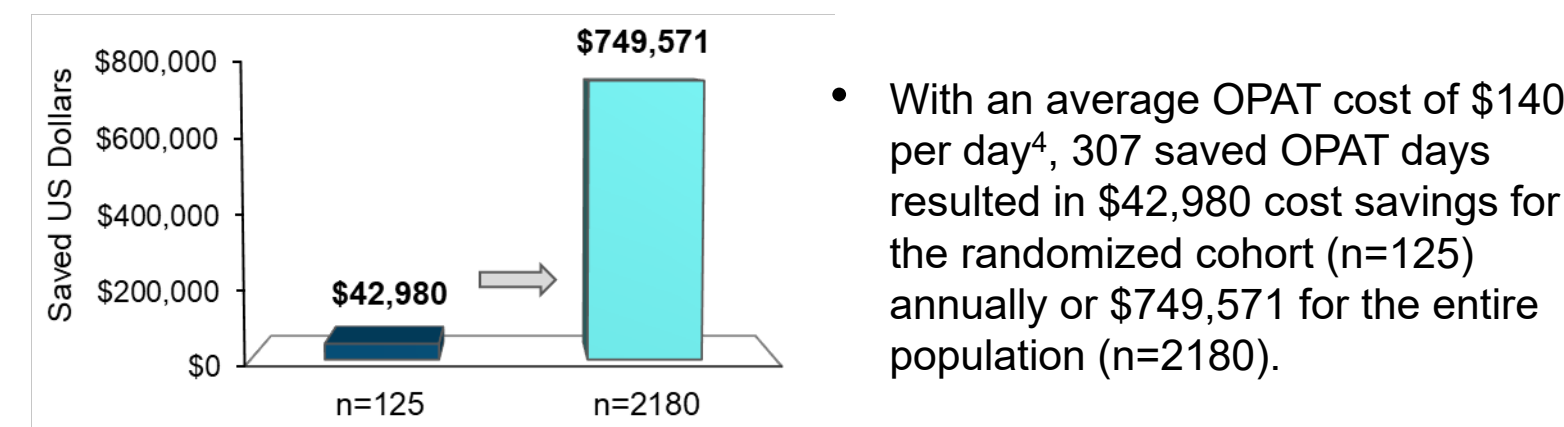
- A total of 51 doses were missed in 2 pts (1 catheter complication, 1 pt refusal)
- All other pts reported compliance with IVAB regimen
- Overall dose adherence rate = 99.3%

Cost Savings

Effect of De-escalation of OPAT



- De-escalation during OPAT, including switch to oral or discontinuation of IVAB was achieved in 52 pts, saving 307 OPAT treatment days (mean: 2.456 days per 125 pts)
- This would extrapolate to 5354.08 saved OPAT days for the total population (n=2180)



- With an average OPAT cost of \$140 per day⁴, 307 saved OPAT days resulted in \$42,980 cost savings for the randomized cohort (n=125) annually or \$749,571 for the entire population (n=2180).

Discussion

This multicenter, retrospective study evaluated adherence to POIC visits and IVAB usage in pts with various infectious diseases, who received home OPAT through a POIC in 2021. De-escalation during OPAT due to favorable therapy response and resulting cost savings were assessed.

- 125 of 2180 random pts from 13 POICs were included (mean age: 50±18 years, 52% male)
- Predominant infection types were BJI (38%), cSSTI (17%), and IAI (15%)
- Cephalosporins were most frequently used for home OPAT (51%), followed by carbapenems (21%). In the cohort 17% self-administered 2 or more concomitant IVABs.
- Home IVABs were the most commonly administered q24h (53%) with an overall mean OPAT duration of 38 ± 9 days
- Overall, pts completed 99.6% of their POIC visits as scheduled.
- OPAT completion was highly favorable, with 94.4% of pts completing treatment. 5.6% discontinued OPAT due to adverse events, hospitalizations, or pt non-adherence.
- IVAB dose adherence was 99.3% indicating high pt compliance to the OPAT plan of care
- De-escalation of OPAT was achieved in 12% of pts, ultimately saving an average of 2.4 treatment days per pt. This resulted in cost savings of \$42,980 in this cohort, extrapolated to \$749,571 for the entire cohort.
- The limitations of our study include potential response bias inherently associated with patient self-reporting regarding dose adherence.

Conclusion

Home OPAT provided through ID POICs demonstrated high rates of adherence for scheduled POIC visits and IVAB dose adherence across multiple types of infections with long lengths of therapy.

Weekly visits to the ID POIC contributed to high adherence to planned therapy.

Close physician therapy management and appropriate antimicrobial stewardship resulted in OPAT de-escalation with an estimated cost saving of almost \$750,000 annually in 13 POICs providing home OPAT.

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