



Treatment Adherence and Outcomes Associated with Partial Oral Therapy vs. Intravenous Therapy in Patients with Serious *Staphylococcus aureus* Infections: A Comparative Effectiveness Study

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Background

- Severe *S. aureus* infections have historically been treated with prolonged intravenous (IV) antibiotic courses
- Prolonged IV therapy may place substantial strain on patients and healthcare systems
- In 2019, the POET and OVIVA trials demonstrated transitioning from IV to oral therapy is noninferior to all IV therapy for serious *S. aureus* infections^{1,2}
- Compared with all IV regimens, partial oral therapy may reduce treatment-related adverse events, costs, and hospital length of stay³⁻⁷ but could be associated with lower antibiotic adherence and treatment completion rates
- The purpose of this study is to evaluate antibiotic adherence, treatment completion rates, and clinical outcomes associated with partial oral therapy compared with intravenous regimens in clinical practice

Objectives

- Compare antibiotic adherence, treatment completion rates, and clinical outcomes between all IV therapy and oral step-down therapy deep-seated and endovascular infections due to *S. aureus*

Methods

Study Design:

- Retrospective cohort study of adults hospitalized at Denver Health between January 1, 2019 and June 30, 2021 with a serious *S. aureus* infection

Inclusion/Exclusion criteria:

- Inclusion:** diagnosis of *S. aureus* bacteremia, infective endocarditis, osteomyelitis, or septic arthritis
- Exclusion:** second or more episode of infection, not a candidate for oral antibiotics, left against medical device before therapy plan was determined, transferred from outside hospital or facility, or had incomplete records or follow-up planned outside of study institution

Co-Primary Outcomes:

- Antibiotic adherence (percent of planned antibiotics taken or received) and the proportion who completed therapy

Key Secondary Outcome:

- Clinical failure: a composite of all-cause mortality, recurrence of infection, new metastatic site of infection, or requirement of an unplanned source control procedure within 6 months after index hospital admission

Results

Characteristic	All Intravenous Therapy (N=101)	Partial Oral Therapy (N=148)
Age, median (IQR)	57 (48-65)	55 (42-62)
Male sex, N (%)	70 (69)	115 (78)
ICU admission, N (%)	33 (33)	14 (10)
Comorbidities, N (%)		
Heart disease	51 (51)	64 (43)
Diabetes	38 (38)	68 (46)
Unstable housing	25 (25)	42 (28)
Chronic liver disease	20 (20)	20 (14)
Surgery within 30 days	10 (10)	12 (8)
CKD on dialysis	11 (11)	5 (3)
HIV	5 (5)	2 (1)
Antimicrobial prophylaxis prior to admission	1 (1)	3 (2)
Immunosuppression	4 (4)	2 (1)
Trauma within 30 days	2 (2)	1 (1)
Active substance use disorder ^b , N (%)	26 (26)	46 (31)
PWID ^c , N (%)	17 (17)	28 (18)
Initiated or maintained on MAT ^d , N (%)	16 (16)	18 (12)
QSOFA score ^e , N (%)		
0	46 (46)	99 (67)
1	37 (37)	46 (31)
2	13 (13)	2 (1)
3	5 (5)	1 (1)

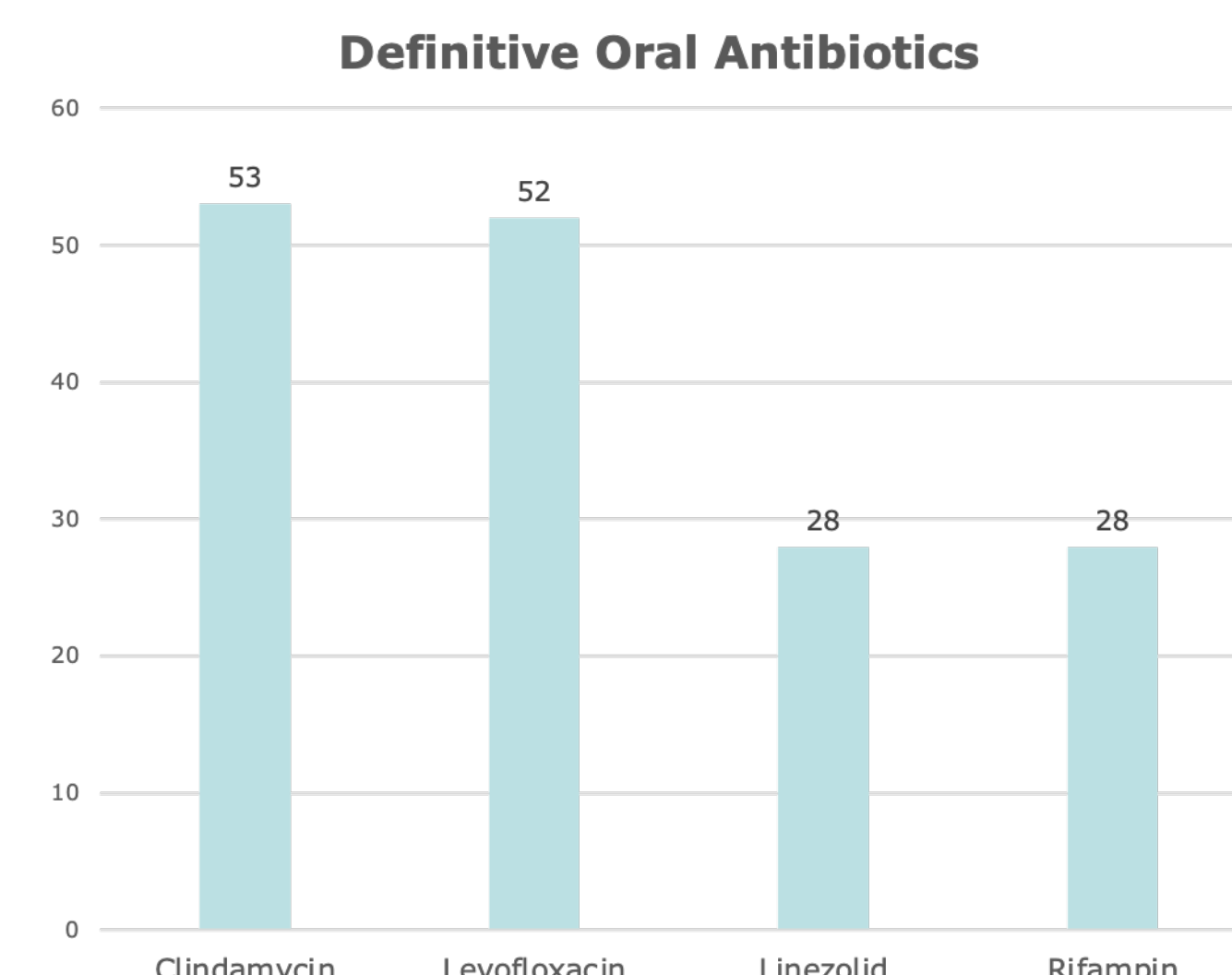
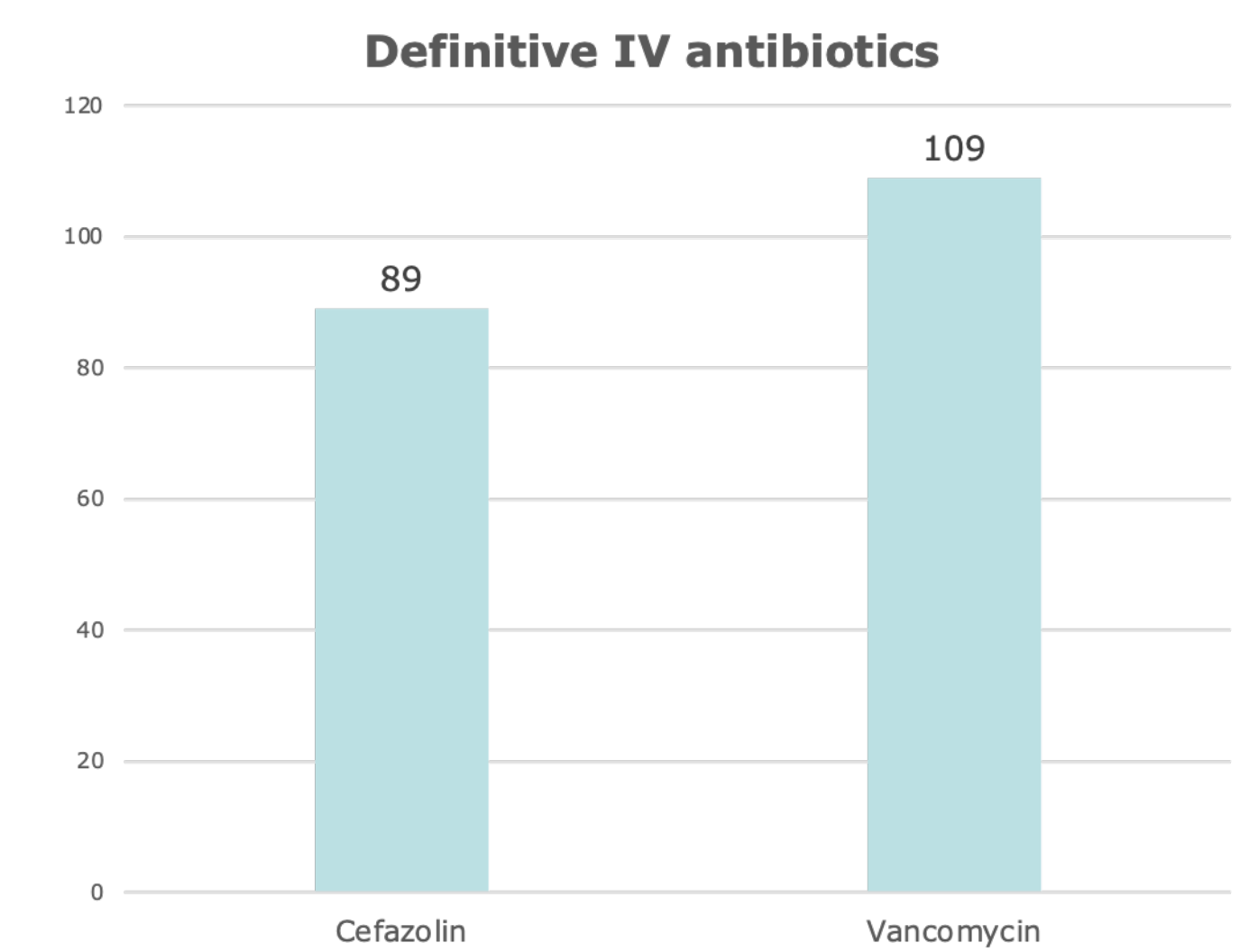
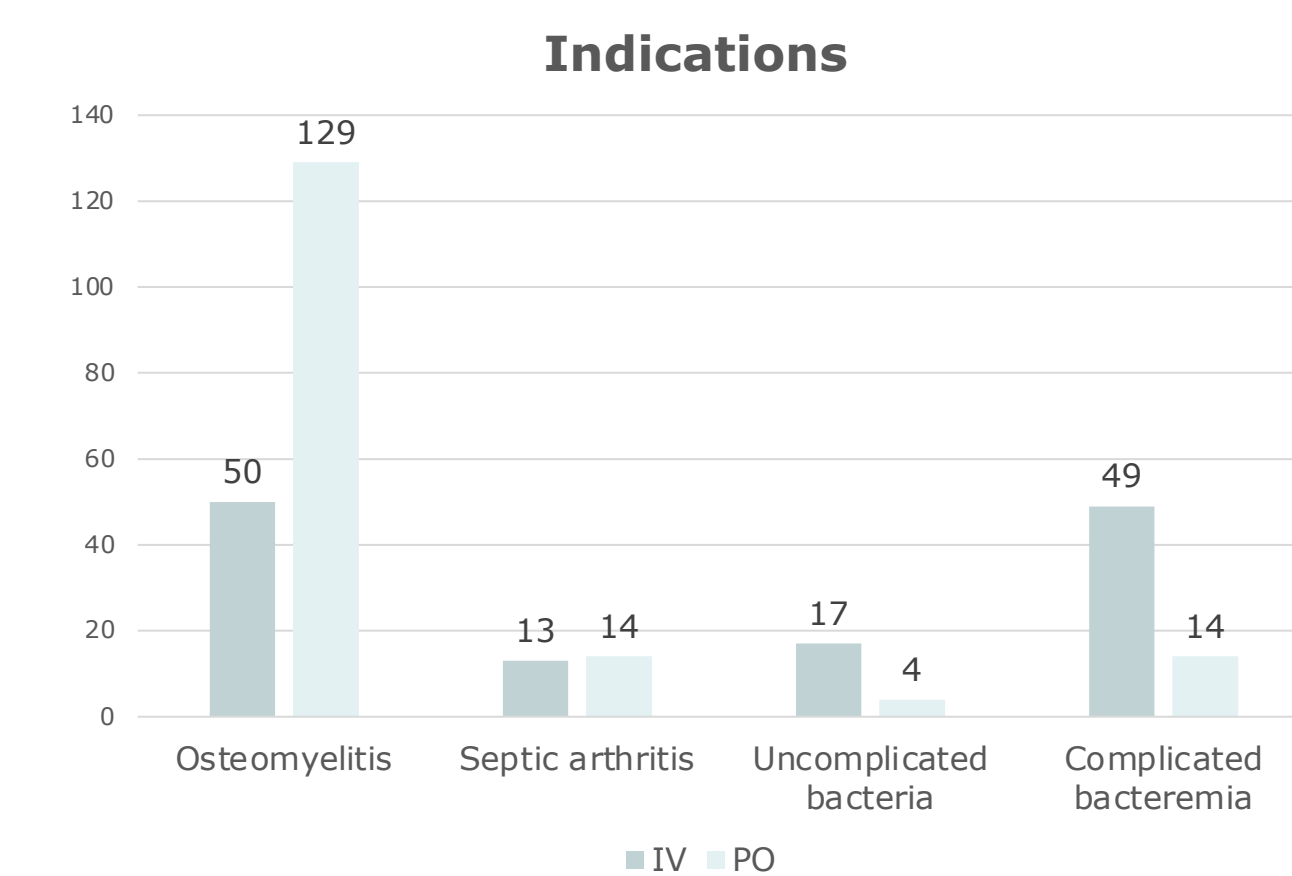
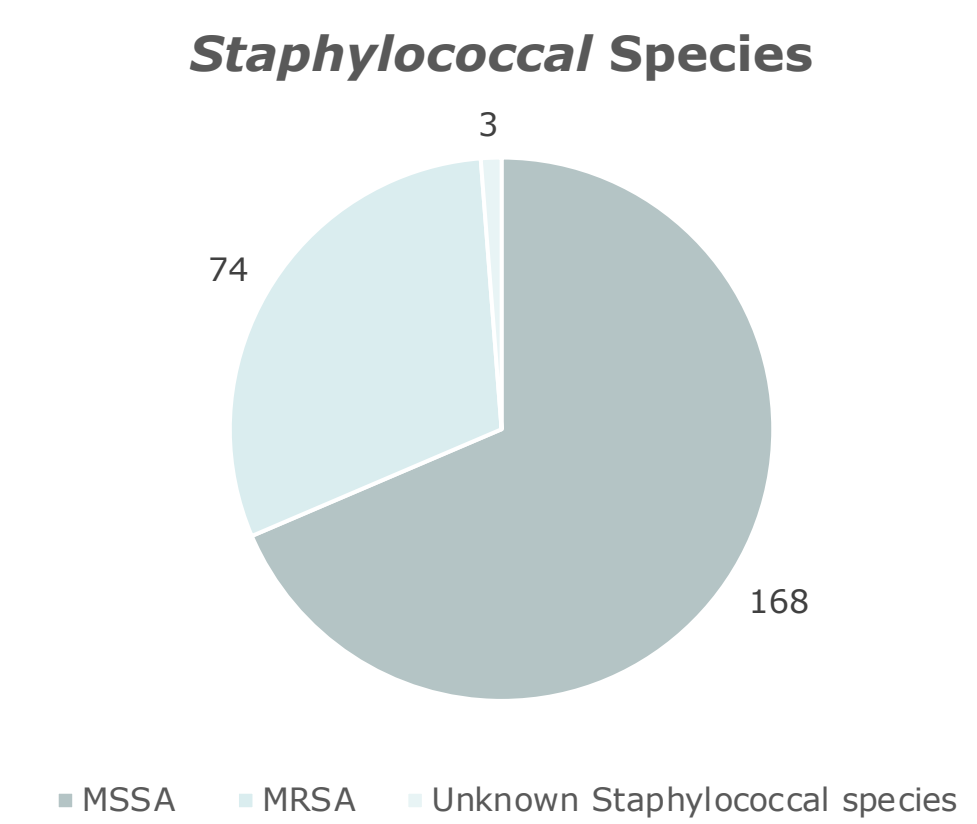
^aICU admission at any point in hospitalization

^bActive use of opiates, alcohol and/or stimulants within the last year

^cPWID- persons who inject drugs within the last year

^dMAT- medication assisted therapy

^eqSOFA- quick sequential organ failure assessment based on data collected 48hr after positive culture



Results Continued

Characteristic	All IV Therapy (N=101)	Partial PO Therapy (N=148)	P value
<i>Co-primary outcomes</i>			
Antibiotic therapy completed, N (%)	94 (93)	129 (87)	0.13
Adherence to therapy, N (%)			0.22
<50%	4 (4)	7 (5)	
50-75%	4 (4)	10 (7)	
76-90%	4 (1)	7 (5)	
>90%	92 (91)	124 (84)	
<i>Key secondary outcomes</i>			
Switch in therapy, N (%)	34 (34)	49 (33)	0.93
Clinical failure, N (%)	25 (25)	38 (26)	
All-cause mortality	11 (11)	7 (5)	0.06
Positive culture after initial clearance	7 (7)	4 (3)	0.20
Unplanned surgery	9 (9)	30 (20)	0.02
Metastatic site of infection	8 (8)	3 (2)	0.06
Percent of antibiotics received outpatient, median (IQR)	50 (0-83)	80 (60-90)	<0.01
Loss to follow-up, N (%)	13 (13)	30 (20)	0.13
Readmission within 6 months for original infection, N (%)	20 (20)	36 (24)	0.40
Hospital length of stay, median (IQR)	12 (9-23)	6 (4-9)	

Conclusions

- Length of hospitalization significantly shorter when partial oral therapy utilized
- Bone and joint infections were more likely to be treated with partial oral therapy in comparison to bacteremia and endocarditis infection sources
- Oral step-down therapy for serious *S. aureus* infections was associated with similar rates of treatment adherence, completion rates, and clinical outcomes
- These findings support use of oral step-down therapy as an effective alternative to IV therapy

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