Thrice is Nice: Thrice Weekly Ertapenem versus Daily Ertapenem in Patients on Hemodialysis

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Introduction

- Outpatient parenteral antimicrobial therapy (OPAT) challenges: venous access complications, cost, and non-adherence.
- For patients with end stage renal disease (ESRD) requiring hemodialysis (HD), line preservation is crucial.
- Ertapenem's package insert dosing of 500 mg daily in ESRD patients requires an additional line placement for OPAT.
- Alternatively, there is limited data to support ertapenem 1 gm post-HD thrice weekly (TIW), which Henry Ford Health implemented in 09/2020.

Methods

Objectives

To compare ertapenem daily vs TIW dosing strategies:

1. Transitions of care and discharge delays
2. Readmission or alteration in antibiotics due to treatment failure
3. Safety outcomes including adverse drug events and line complications

Study Design

- IRB approved retrospective cohort study conducted at a five-hospital health system in Michigan

Subjects: Patients admitted between 6/1/19 – 7/31/21

Figure 1.

Inclusion Criteria	Exclusion Criteria
• Adult, ESRD patients (≥ 18 years) on HD • Prescribed OPAT with ertapenem	• Incarcerated • Pregnant or cognitively disabled

Data Collection: Collected from electronic medical records using a standardized case report form

Endpoints

- Primary outcome: Discharge delays
  - Discharge delay was defined as hospitalization continuing after the day a patient was deemed medically stable for discharge. Reasons include prior authorizations related to antibiotic or line insertion.
- Secondary outcomes:
  - Efficacy endpoints: 60-day readmissions & mortality as well as alterations in antibiotics
  - Safety endpoints: Line related adverse events and ertapenem related adverse events

Analysis: Descriptive and bivariate analysis were used for all variables

Results

Demographics

Figure 2. Patient Screening Process

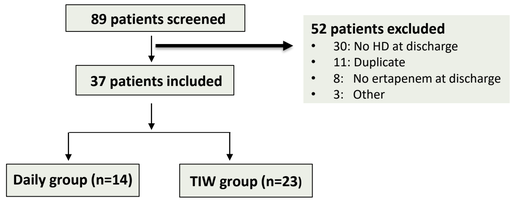


Table 1. Baseline characteristics

Characteristics	Daily (N=14)	TIW (N=23)
Male*	5 (36)	15 (65)
Age, years#	59 (50 - 6)	64 (47 - 70)
BMI, kg/m² #	30 (25 - 40)	26 (20 - 33)
Charleston Index#	5 (4 - 6)	4 (2 - 5)
Seizure history*	2 (14)	3 (13)
Length of therapy, days#	22 (11 - 38)	18 (14 - 42)
Most common indication*	BJI & BSI (29)	ABSSI (30)

Table 2. Organisms

Organism (%)	Daily (N=14)	TIW (N=23)
ESBL producers	30	61
AmpC producers	36	26
E. coli	14	13
K. pneumoniae	7	13

Data are presented as: *n(%), #median (IQR)
BJI: bone and joint infection. **BSI**: Blood stream Infection. **ABSSI**: Acute Bacterial Skin and Skin Structure Infections

Table 3. Discharge characteristics

Characteristics	Daily (N=14)	TIW (N=23)
Length of stay days#	8 (6 - 16)	8 (6 - 15)
Infectious disease consult*	14 (100)	22 (96)

Figure 3. Discharge Disposition

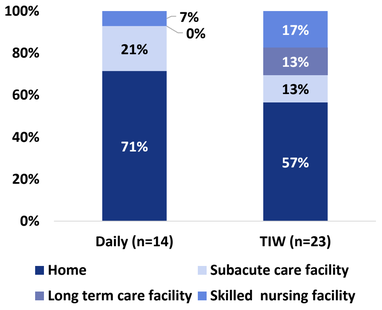
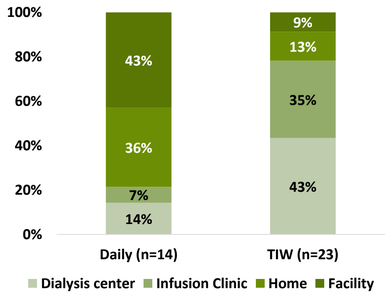


Figure 4. Infusion Facility



Transitions of Care

Figure 5. Line Placement

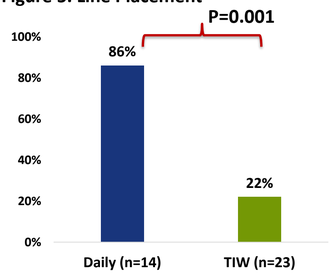
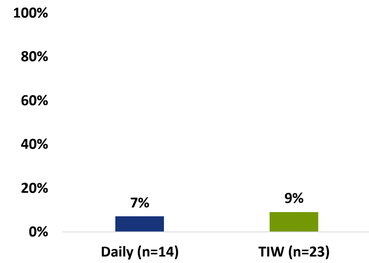


Figure 6. Discharge delays (P=0.938)



Efficacy Endpoints

Figure 7. Mortality and Readmission (P=0.284 and P=0.27, respectively)

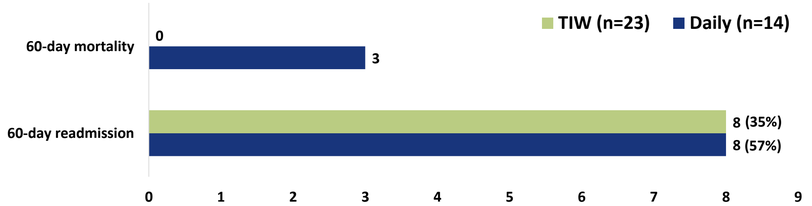


Table 4. Safety Endpoints (P-value >0.05)

Events, n (%)	Daily (N=14)	TIW (N=23)
C. difficile Infection	1 (7)	0
Line displacement*	1 (7)	0
Reason for Alteration of Antibiotics, n (%)	**Daily (N=14)**	**TIW (N=23)**
Adverse Events	0	1 (4)[1]
Worsening of Index Infection	1 (7)	0
Other	1 (7)[2]	1 (4)[3]

*Not due to no line infections or thrombosis. 1. Altered mental status, 2. Hemoptysis 3. New infection in the lungs

Summary

- Ertapenem thrice weekly dosing led to a significant decrease in line placement without compromising efficacy and safety
- This decrease in line insertions can help in line preservation for this population