

Reduced Readmissions with Enoxaparin Bridging for Subtherapeutic INR in MCS

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Background

- Readmissions following mechanical circulatory support (MCS) device implantation continue to be frequent, and supra/subtherapeutic INR remain a major indication for readmission.
- Several studies have shown the relative safety and efficacy of enoxaparin bridging in MCS, while some report an increased risk of bleeding.
- Consequently, there is no consensus on optimal management of subtherapeutic INR in MCS recipients.

Objectives

- We sought to assess whether outpatient enoxaparin in MCS recipients significantly reduced hospital readmissions while maintaining safe and effective anticoagulation.

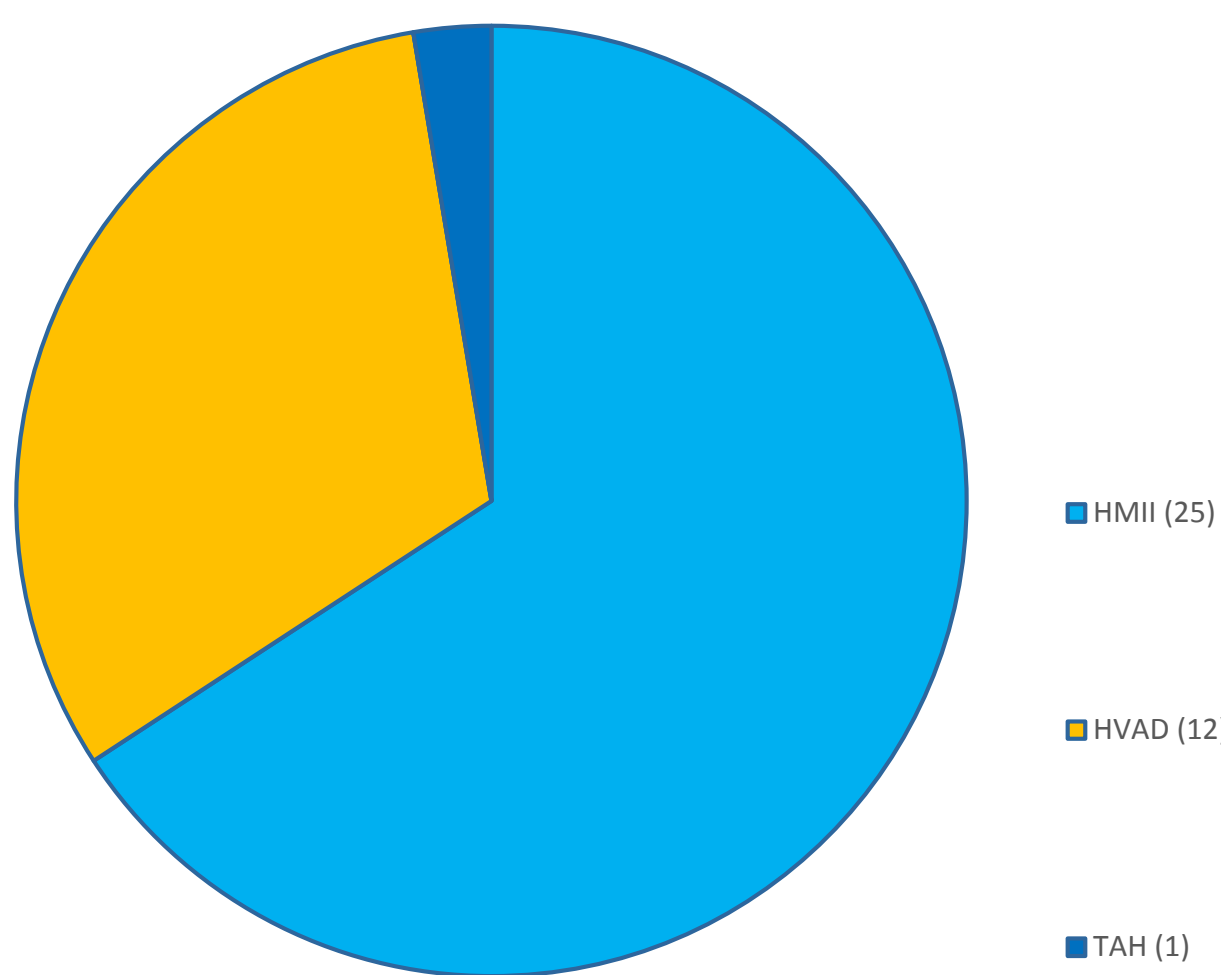


Figure 1. Device distribution among all readmits (n) between October 2015 to July 2017

Methods

- An outpatient enoxaparin protocol was developed and a pilot treatment period was initiated between August 2016 to October 2017
- Enoxaparin/INR managed by UCLA CMY APNs, PharmD and MCS MD.
- Patients who remain subtherapeutic >5 days on warfarin and enoxaparin are to be admitted for heparin bridging
- All-cause readmission rates were compared between the treatment period and the year prior.
- Inclusion Criteria:
 - HeartMate II or HVAD device
 - >30 days post-implant
 - No active bleeding
 - No history of major bleeding
 - No history of thrombosis
 - INR < 1.7
- Exclusion Criteria:
 - Device other than HMII/HVAD
 - <30 days post-implant
 - Active bleeding
 - History of major bleeding
 - History of thrombotic event

Patient Characteristics			
	Historical Group No Enoxaparin N (%)	Study Period: Enoxaparin Bridge N (%)	% Change
Total MCS Readmissions	66	44	
Readmission Reason			
HF Symptoms	15	16	
Low INR	15	5	
Infection	9	6	
Anemia	5	0	
Bleeding	5	2	
Thrombosis	2	4	
Other	15	11	
INR Readmissions	15(22.7)	5 (11.4)	-49.8%
INR Median LOS	3	3	
HMII INR Readmissions	9 (13.6)	1 (2.3)	-83.1%
HVAD INR Readmissions	4 (6.1)	4 (9.1)*	

Figure 2. Patient Characteristics. *Three admissions for one HVAD BiVAD patient not eligible for enoxaparin protocol during study period.

Results

- During the study period, ten patients were bridged with 20 courses of enoxaparin for INR <1.7.
- MCS readmissions for INR were reduced by 49.8% compared to historical period.
- HMII INR readmission reduced 83.1%
- Earliest treatment day: POD 43
- Median INR at enoxaparin start: 1.6 Median INR at enoxaparin stop: 2.3
- The median dose received was 0.56 mg/kg/dose. A median of 6 doses (approx. 3 days) was required. All patients returned to therapeutic INR with enoxaparin therapy in under 5 days.
- There were **no bleeding or thrombotic events** in treated patients at any time.

Conclusions

- Outpatient enoxaparin bridging for subtherapeutic INR in MCS recipients can be safe, effective, and greatly reduce readmission rates