

Hypertension During Clevidipine Infusion: Dosing Insights For Better ICU Blood Pressure Management

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Critical Care Medicine

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Disclosures

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Siyu Ma, co-author, is a **Chiesi USA, Inc.** employee.

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Background

Management of hypertension is crucial for **optimizing ICU outcomes** and **mitigating adverse-event risks**.

We sought to **identify factors** associated with **hypertension control** during ICU treatment with **clevidipine**, an ultra-short-acting dihydropyridine calcium channel blocker.

We conducted a **retrospective analysis** of ICUs from a single urban academic medical center (neurocritical ICU, surgical ICU, cardiac ICU, & mixed-use ICU).



Methods

Data: Electronic data during clevidipine infusion

- Continuous arterial blood pressure data from the Philips Capsule data archiving system
- Individualized BP target ranges from provider orders
- Infusion dose from nursing documentation

Primary outcome: BP control (% of time BP was above target range)

Analysis: Univariable linear regression

Subject Characteristics

	Cohort
Number of subjects	105
Duration of ICU data analyzed, median (IQR)	5.6 hrs (2.2 – 15.6)
Age, median (range)	62 yrs (21 – 88)
Gender	
% Male	69.5 %
% Female	30.5 %
Race	
% White	71.4 %
% Black or African American	8.6 %
% Asian	4.8 %
% Unknown or not reported	15.2 %
Patient mortality	
% Survived to discharge	88.6 %
% Did not survive to discharge	11.4 %

	Cohort
Indication for use: <u>Non-operative</u>	
% Intracranial hemorrhage (ICH)	23.8 %
% Other neurocritical	1.9 %
% Aorta	5.7 %
% Other cardiovascular	0.9 %
% Not neuro / cardiovascular	2.9 %
Indication for use: <u>Post-operative</u>	
% Intracranial hemorrhage (ICH)	6.7 %
% Other neurocritical	6.7 %
% Aorta	19.0 %
% Other cardiovascular	29.5 %
% Not neuro / cardiovascular	2.9 %

Investigational Parameters

Patient factors

- Age
- Gender
- Indication for use (neuro / cardiovasc)
- BP variability (standard deviation / hr)
- Peak infusion dose (mg / hr)

Clinician management factors

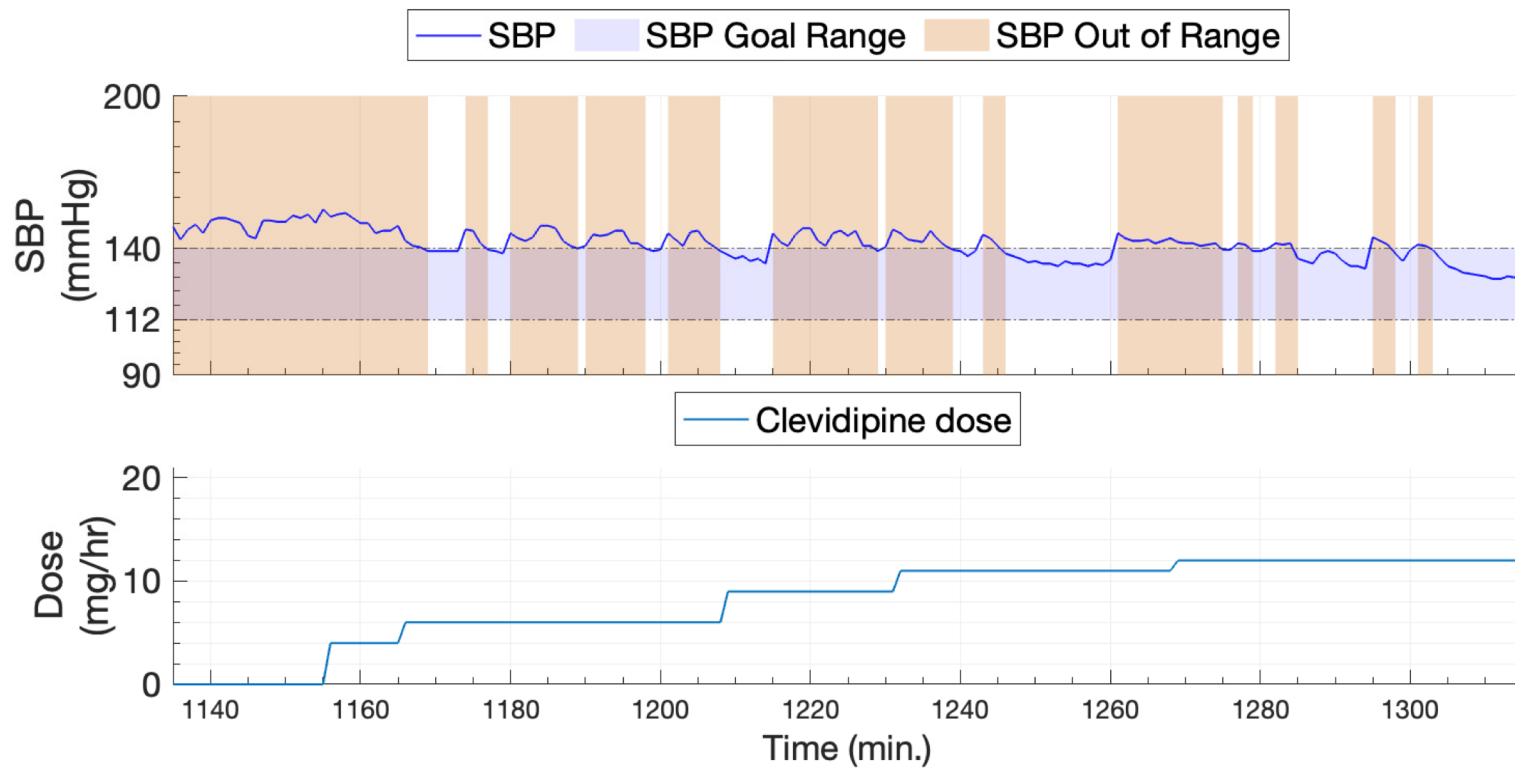
- Up-titration interval during hypertension (i.e., BP > goal)
- Up-titration interval during goal range (i.e., BP within goal range)
- Down-titration interval during goal range
- Failed weans / hr
- Other IV anti-hypertensive agents



Examples

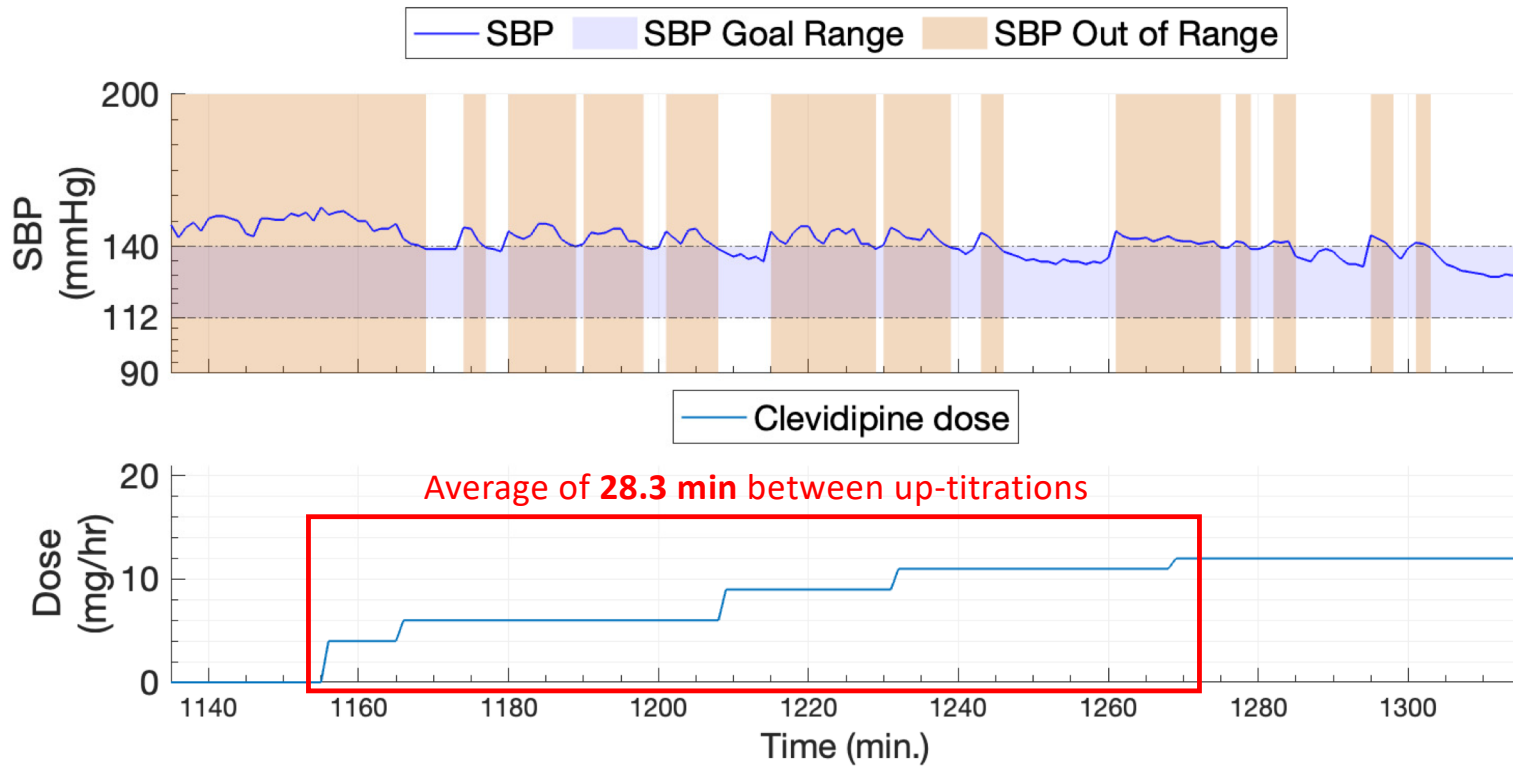
Slow Clevidipine Up-Titration During Hypertension

52 y/o Asian male with intracranial hemorrhage / BP in-range **47.6%** of ICU stay



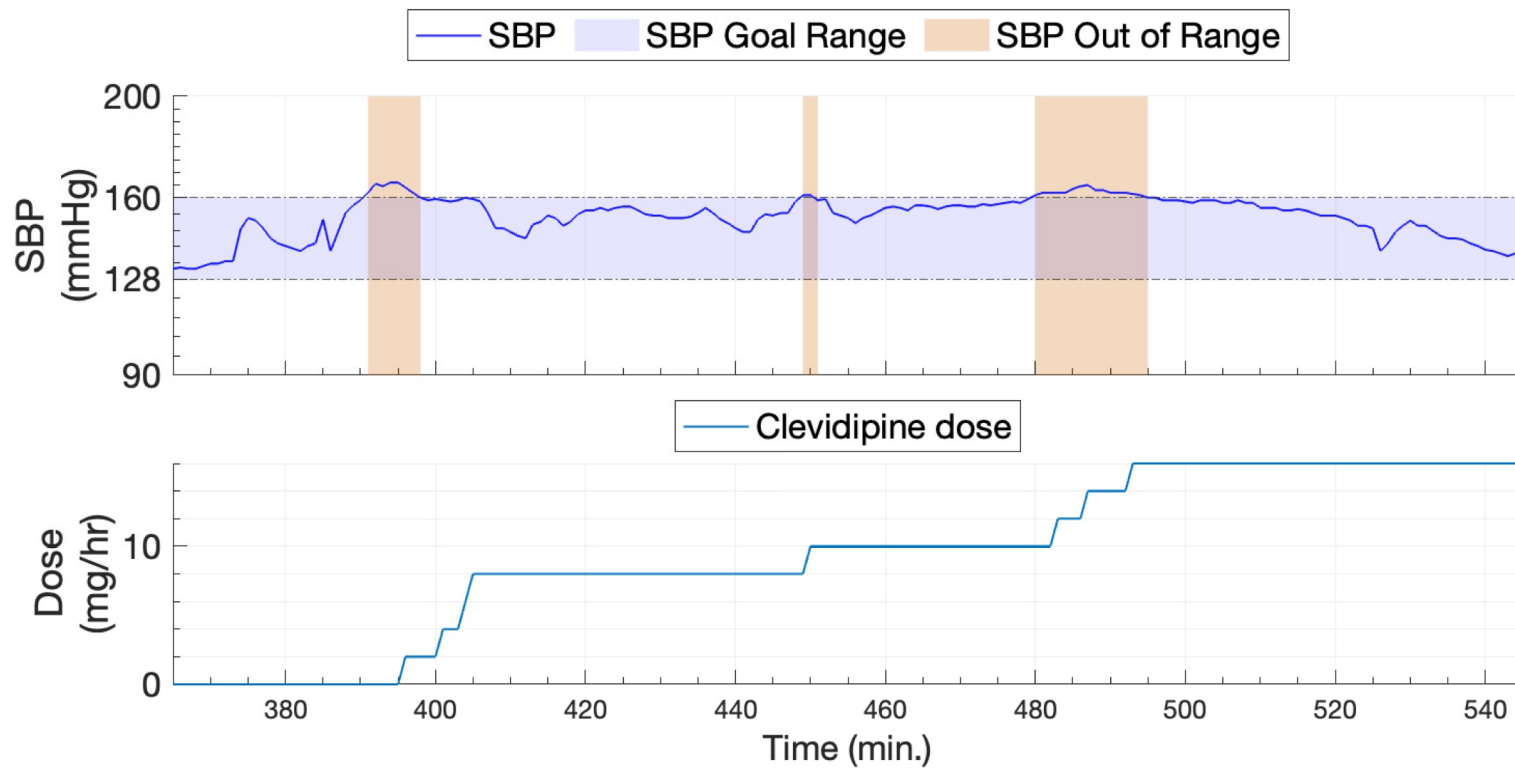
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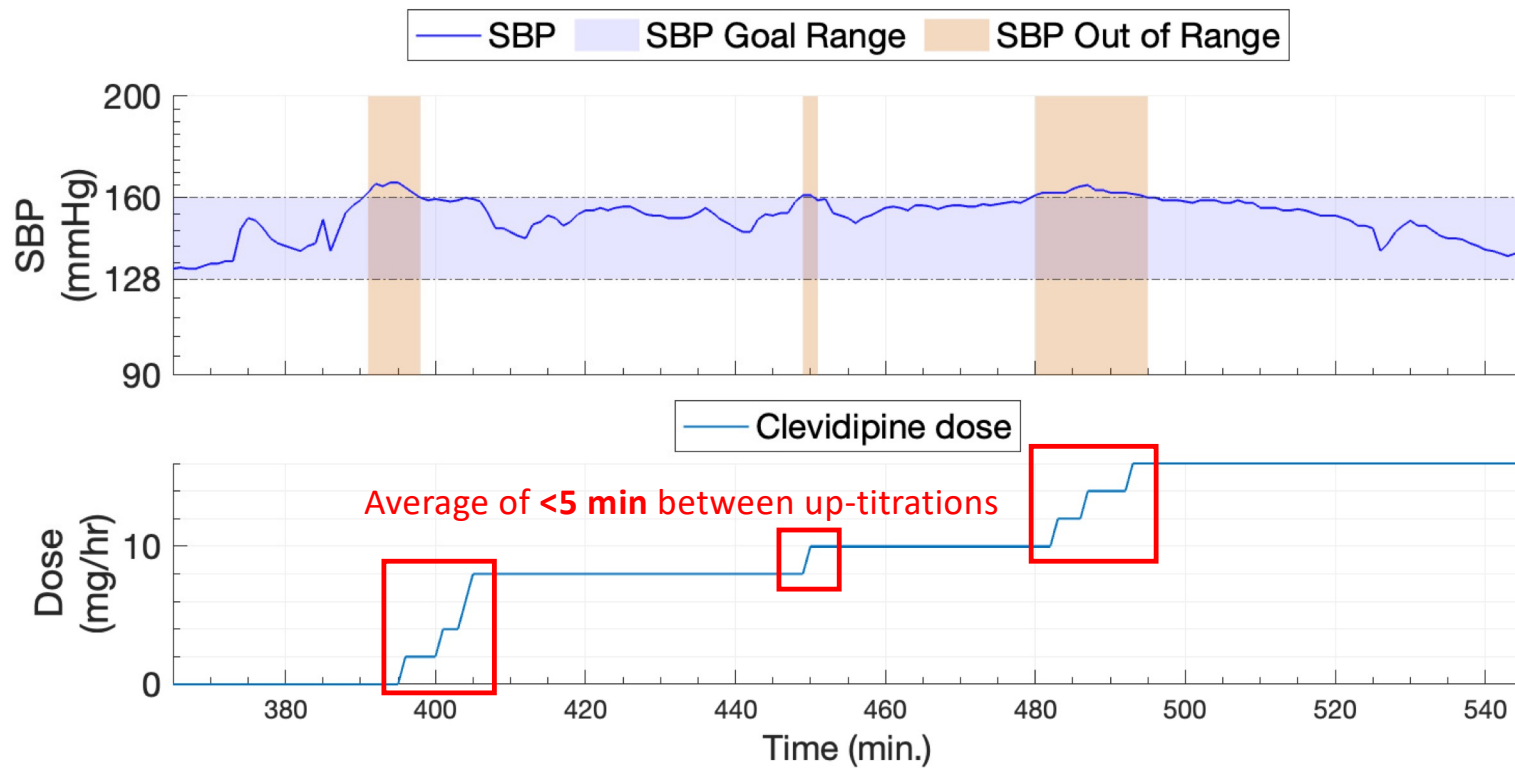
Rapid Clevidipine Up-Titration During Hypertension

52 y/o Black male with intracranial hemorrhage / BP in-range **96.6%** of ICU stay



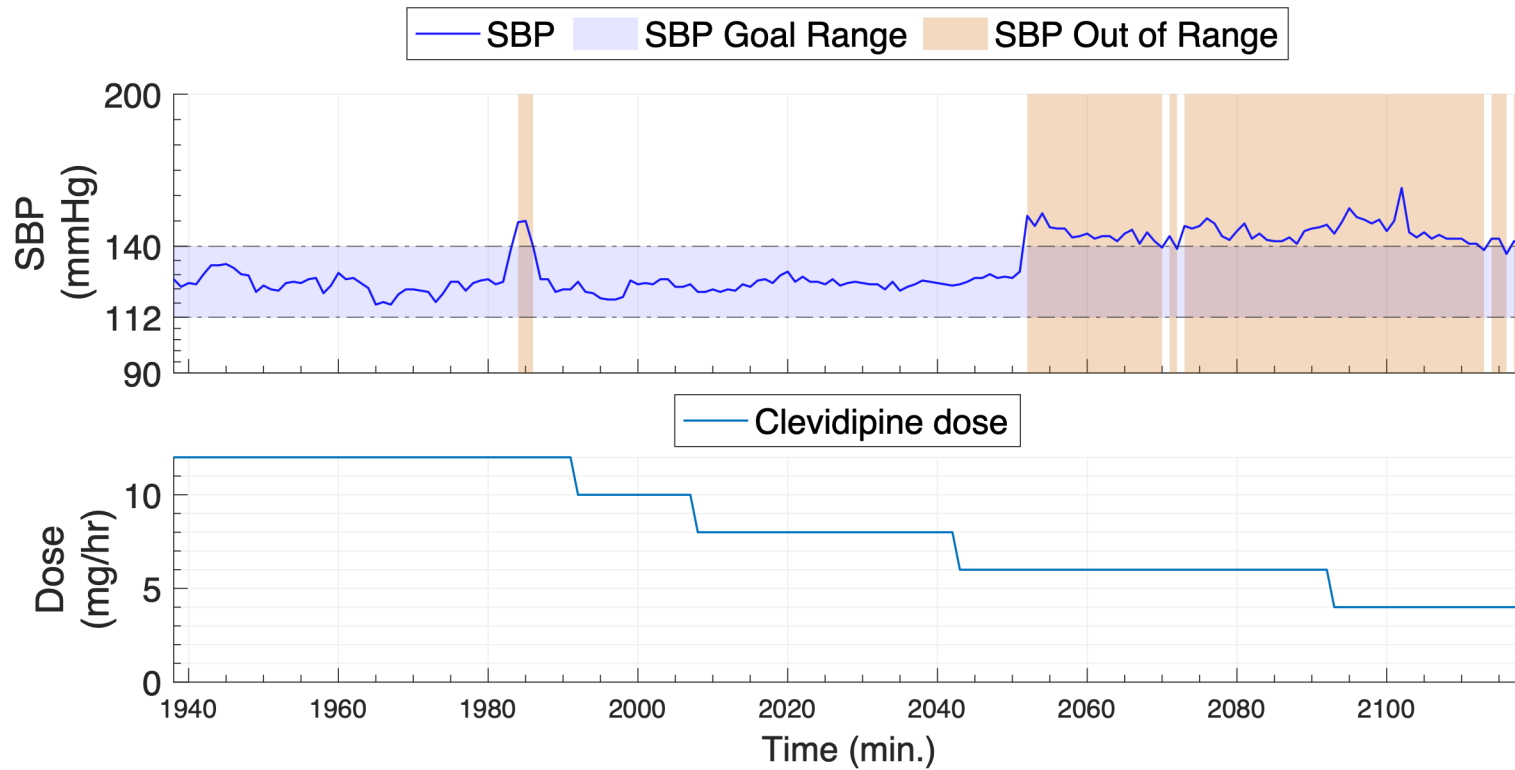
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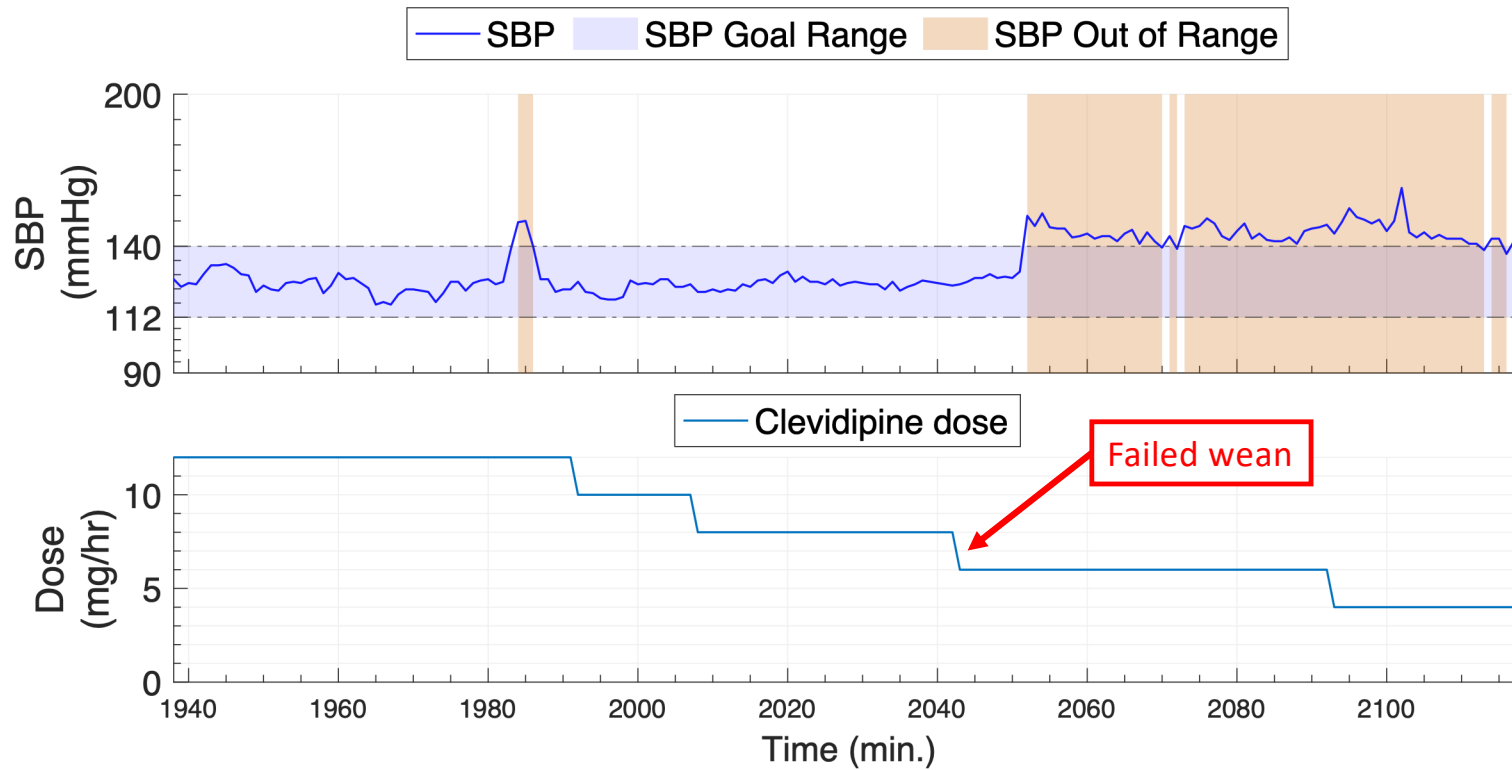
Failed Wean (Hypertension <30min After Down-Titration)

34 y/o White male with intracranial hemorrhage / BP in-range **76.8%** of ICU stay



Failed Wean (Hypertension <30min After Down-Titration)

34 y/o White male with intracranial hemorrhage / BP in-range 76.8% of ICU stay



Investigational Parameters

(Univariable linear regression with % of time BP above-range)

Investigational Parameter	β -coefficient	p-value	n
Patient factors			
Age	-0.17	0.16	105
Gender	4.35	0.29	105
Primary indication (neuro = 1 / cardiovasc = 0)	8.09	0.03	105
BP variability (hourly standard deviation)	0.81	0.10	105
Peak infusion dose	4.39	0.02	105

Investigational Parameters

(Univariable linear regression with % of time BP above-range)

Investigational Parameter	β -coefficient	p-value	n
Patient factors			
Age	-0.17	0.16	105
Gender	4.35	0.29	105
Primary indication (neuro = 1 / cardiovasc = 0)	8.09	0.03	105
BP variability (hourly standard deviation)	0.81	0.10	105
Peak infusion dose	4.39	0.02	105
Clinician factors			
Up-titration interval during hypertension	15.8	< 0.00001	44
Up-titration interval during goal range	0.74	0.70	105
Down-titration interval during goal range	-0.21	0.90	105
Failed weans / hr	7.91	< 0.00001	105
Other IV anti-hypertensives agents used	6.77	0.07	105

Conclusion

- Suboptimal BP control **significantly associated** with **longer up-titration interval during hypertension** and **failed weans per hour**
- Substantial ICU hypertension may be **preventable** with **optimized** medication up-titration and down-titration **during clevidipine infusion**



Contact Information

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