

# Hospitalized COVID-19 Patients with Elevated Cardiac Troponin I (cTnI) Have Increased Length Of Stay but Similar Ventilation Time

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## Background

COVID-19 is an immediate health threat causing SARS-CoV-2 with known increased mortality and morbidity in patients with cardiovascular disease. At admission, serological markers are commonly used to evaluate patients with cardiopulmonary pathology, including the viral pneumonia such as COVID-19. There is wide variation in the disease's presentation. About 80% of patients present with mild symptoms, requiring only outpatient treatment, however the rest (~20%) are admitted to the hospital.

Laboratory diagnostic predictors of severe disease, including SARS-CoV-2, have yet to be fully elucidated and established. Historically, cardiac complications are associated with poorer outcomes for inpatient management of pneumonia, including elevation in serological markers, such as troponin and BNP. Hence it is reasonable to hypothesize that cardiac serological markers may help identify the subsets of COVID-19 patients that progress to worse clinical outcomes, including death.

Understanding how laboratory values predict disease severity is important for clinicians to guide therapy and triage patients

## Objective

- To investigate if **elevated cardiac troponin I (cTnI)** can identify subsets of **COVID-19** patients that progress to **worse clinical outcomes**.

## Methods

A cross sectional study was performed utilizing the **184 hospital United States database** of HCA. Patients were selected based on inpatient visits to HCA facilities from February 2020 to May 2020 with a COVID-19 diagnosis and **at least one cTnI lab test**. Patients were divided according to an elevated or normal cTnI value based on the 99th percentile reference range of the test. **Outcomes, such as length of stay and time on the ventilator,** were compared.

### Study period:

February 2020 to May 2020

### Inclusion Criteria

- Age ≥18
- At least one troponin value
- COVID-19 diagnosis

### Two Groups:

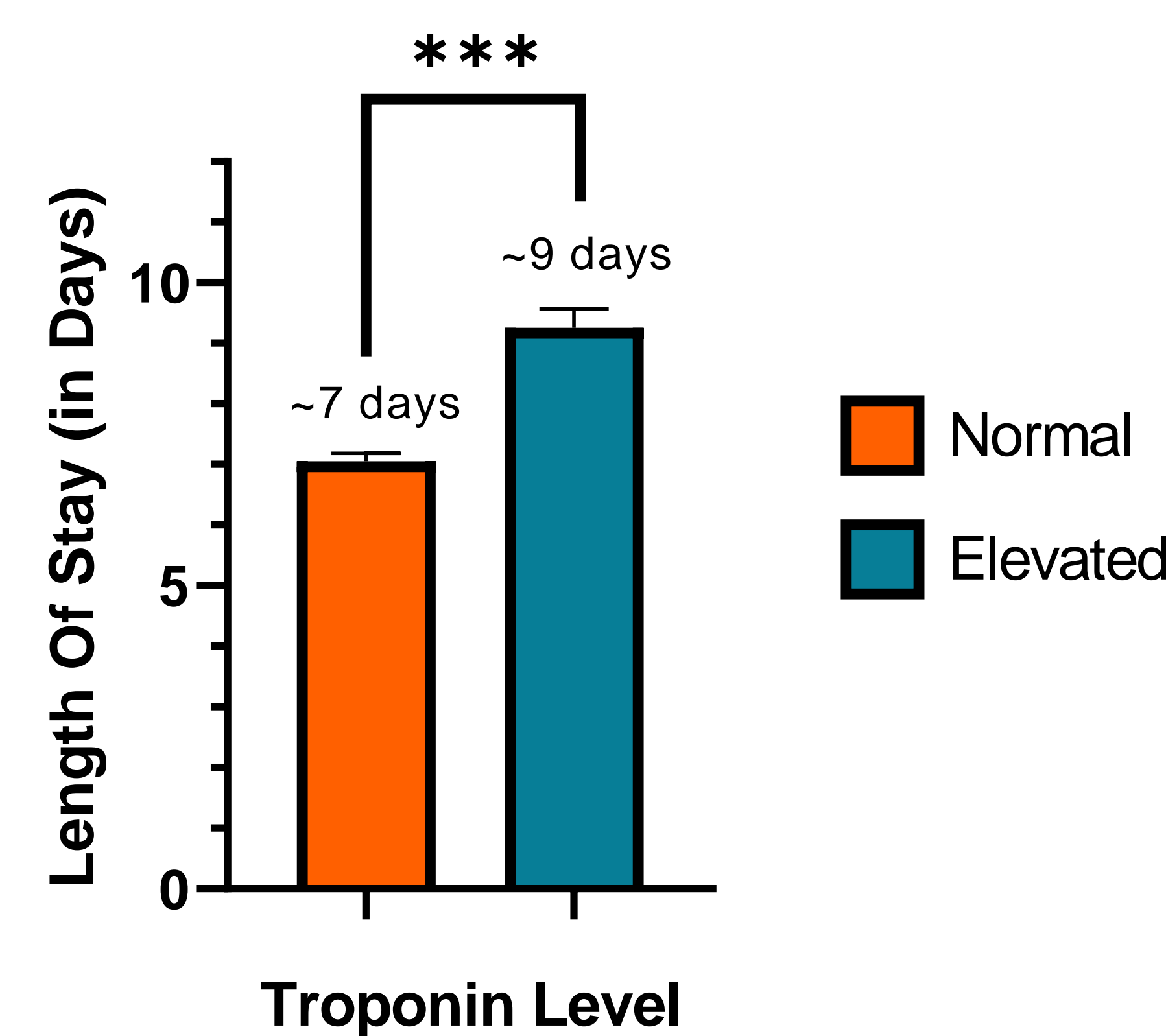
- Elevated cTnI**  
(n = 648)
- Normal cTnI**  
(n = 3,160)

### Outcomes

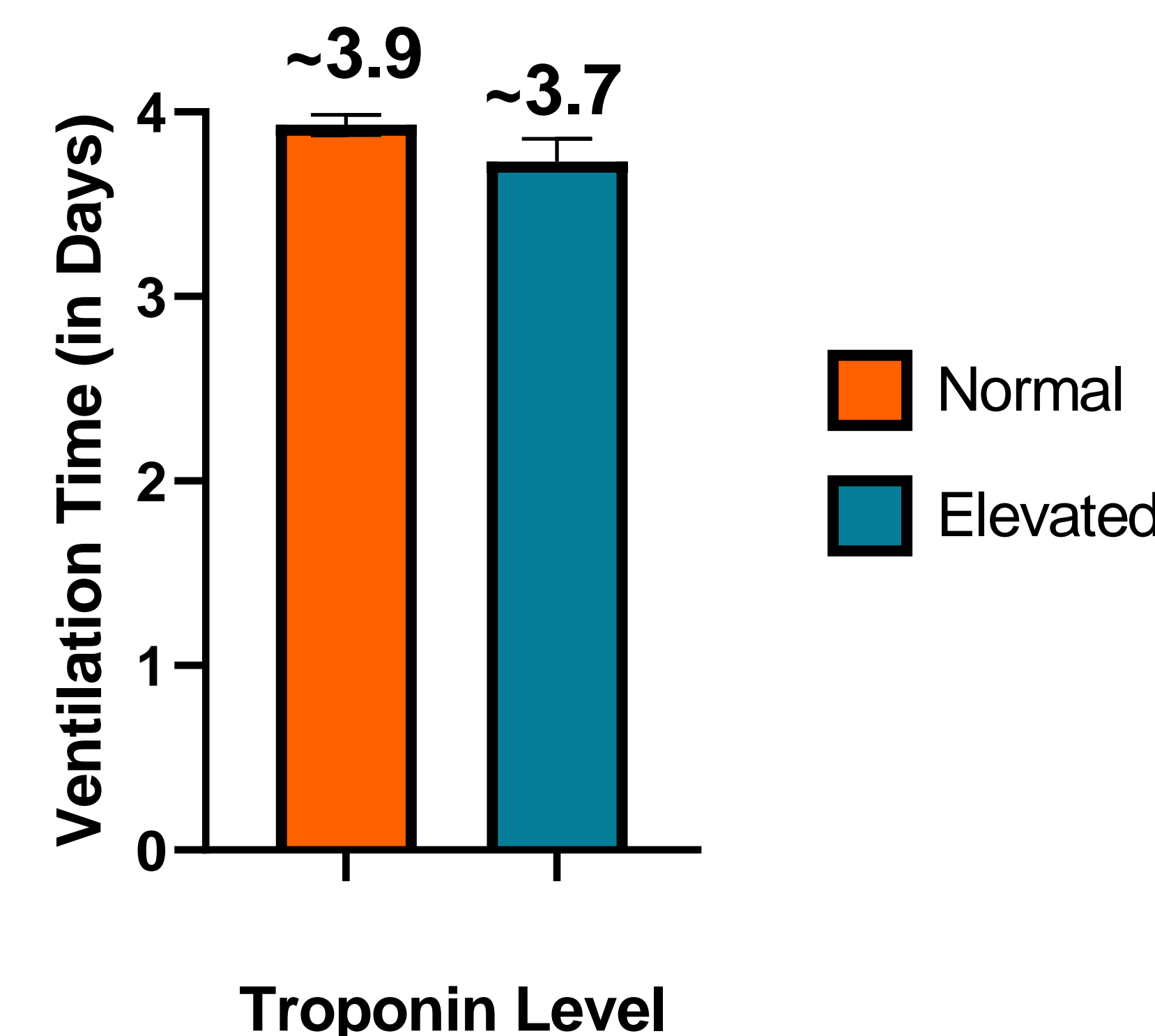
- Length of Stay
- Time On The Ventilator

## Results

Effect of Troponin Level On Length of Stay for COVID-19 Positive Patients



Effect of Troponin Level On Ventilation Time for COVID-19 Positive Patients



## Discussion

- 3091 patients hospitalized with COVID-19 were identified. Of those, 2544 patients had at least one cTnI test throughout their hospitalization. 547 (17.7%) had at least one positive cTnI during their hospitalization. **Patients with at least one positive cTnI were hospitalized on average for 9.25 days,** whereas **patients without positive cTnI were hospitalized on average for 7.05 days** ( $p < 0.001$ ). 1408 patients without positive cTnI were sent home without health care, but only 131 with positive cTnI were discharged home without requiring home health ( $p < 0.001$ ). Need for mechanical ventilation was also higher in the elevated cTnI group. If intubated, **patients in both groups required on average the same amount of ventilator time, 3.87 days** ( $p = 0.4103$ ).

## Conclusion

Patients with at least one positive cTnI during their hospitalization had increased length of stay and decreased likelihood of being discharged home without home health. Using a large nationwide database we confirmed previously published findings in smaller patient populations associating cardiovascular disease with COVID-19 severity. Once patients were intubated, **both subsets of patients with and without elevated cTnI had similar days on the ventilator,** suggesting the COVID-19 acute respiratory distress syndrome (ARDS) has a more complicated relationship to troponin levels. These findings suggest that patients with an increased cTnI should be triaged to receive aggressive management.

## References

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	Total (N=3,091)		Normal(n=2,544)		Elevated (n=547)		P
	Mean/%	SD/n	Mean/%	SD/n	Mean/%	SD/n	
Age	62.77	16.63	61.18	16.51	70.16	15.1	7 <.001
Female	46.59	1440	48.15	1225	39.31	215	<.001
Race/Ethnicity							
White	37.43	1157	35.42	901	46.80	256	<.001
Black	27.86	861	28.18	717	26.33	144	
Hispanic	26.14	808	27.56	701	19.56	107	
Asian	4.40	136	4.52	115	3.84	21	
Others	4.17	129	4.32	110	3.47	19	
Hospitalization	7.44	6.88	7.05	6.70	9.25	7.38	<.001
Discharge information							
Home/Self-care	52.12	1611	58.18	1480	23.95	131	<.001
Inpatient/SNF/Home							
Health	21.35	660	21.54	548	20.48	112	
Death	15.46	478	11.08	282	35.83	196	
Hospice	6.70	207	5.07	120	14.26	78	
Others	4.37	135	4.13	105	5.48	30	
Ventilation days	3.87	2.83	3.93	2.80	3.73	2.90	0.4103