

Excess Medical Costs of Malignant Hyperthermia in the United States, 2017 - 2021



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INTRODUCTION

-Malignant hyperthermia (MH) is a rare but severe pharmacogenetic disorder triggered by inhaled general anesthetics and succinylcholine in people with certain mutations in the RYR1 gene.

-Despite proper treatment with dantrolene, the mortality rate from MH is thought to be between 3% and 5%. (Watt et al., 2023)

METHODS

Data source: HCUP National Inpatient Sample (NIS) 2017-2021 (represents approx. 20% of all hospital admissions in the US)

Case Identification: Patients with MH diagnosis (n = 320): identified through ICD-10-CM code (T88.3)

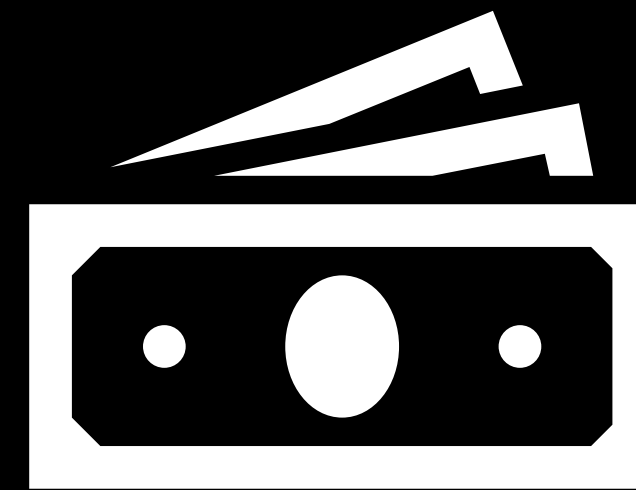
Matching criteria: Patients without MH diagnosis (n = 1196): for each MH patient, up to five patients without MH diagnosis are randomly selected from the same year and the same hospital as the MH patient. Patients without MH diagnosis and the patient with MH diagnosis are matched on age (± 2 years), sex, admission mode, DRG, and principal procedure.

Outcomes: Primary outcome is total hospital cost based on total hospital charges from admission to discharge corrected by the cost-to-charge ratios; Secondary outcome is length of stay (LOS) measured in days between admission to discharge

MAIN RESULTS: Total Hospital costs

	Patients With MH (n = 320)	Patients without MH (n = 1196)	Δ	P Value
	*Costs in thousands	*Costs in thousands		
Mean ($\pm$ SD)	63.76 $\pm$ 171.99	30.94 $\pm$ 58.10	32.82	<0.001
Median (IQR)	26.40 (13.87–54.96)	15.28 (7.13–31.25)	11.12	<0.001

- Estimated annual number of inpatients with MH diagnosis in U.S: 315
- Average excess hospital costs per inpatient with MH diagnosis: \$32,821
- Total annual hospital costs attributed to MH in U.S.: \$10,338,615
- Patients with MH diagnosis have a higher mean LOS of 3 days



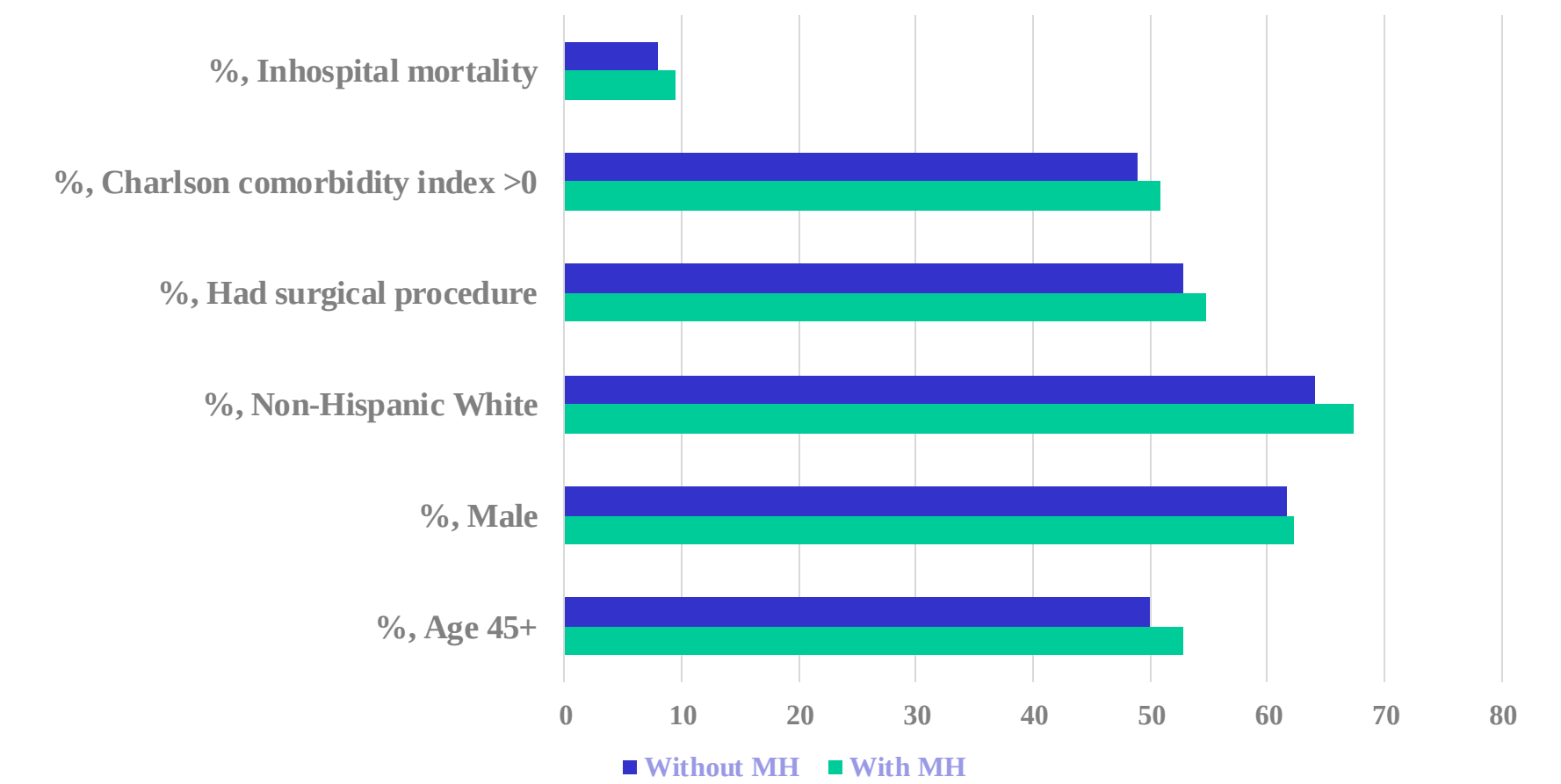
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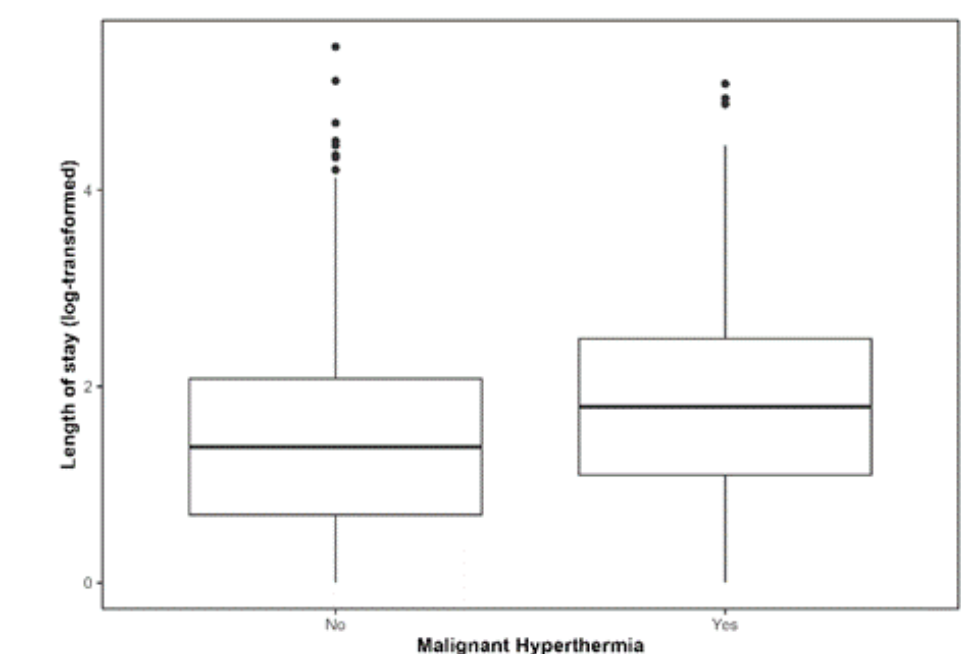


Patient Characteristics:



Secondary Outcome: Length of Stay

	Patients With MH (n = 320)	Patients without MH (n = 1196)	Δ	P Value
	*in days	*in days		
Mean ($\pm$ SD)	11 $\pm$ 19	8 $\pm$ 13	3	<0.001
Median (IQR)	6 (3–12)	4 (2–8)	2	<0.001



Discussion:

- MH diagnosis does not necessarily refer to MH episode (about one-third of patients with MH diagnosis may have experienced an MH episode)
- MH susceptibility is likely underestimated by MH diagnosis recorded at hospital discharge based on ICD-10-CM code.
- Excess medical costs attributed to MH are explained to a large extent by excess LOS
- Further research is warranted to better understand the causes of the excess medical costs and LOS for patients with MH diagnosis