

# Healthcare Resource Utilization and Costs of Non-Obstructive Hypertrophic Cardiomyopathy in the United States

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## INTRODUCTION

- Non-obstructive hypertrophic cardiomyopathy (nHCM) is the fastest growing diagnosed population within HCM.
- There are limited data evaluating healthcare resource utilization (HRU) and costs of care for patients with nHCM.

## OBJECTIVES

- To quantify annual disease-related HRU and costs pre and post HCM diagnosis using Optum medical and pharmacy claims and electronic medical record data.

## METHODS

### Study Design

- Retrospective cohort study of adult patients with HCM in Optum's Market Clarity database from January 1, 2013, through December 31, 2021 (Index date = first nHCM diagnosis). Market clarity includes administrative claims and electronic medical record data.

### Inclusion criteria

- Evidence of nHCM:** Patients with nHCM met the following selection criteria:
  - ≥2 medical claims with a diagnosis code for nHCM (ICD-9: 425.11 or 425.18; ICD-10: I42.2) in any position on different dates of service ≥30 days apart during the patient identification period.
  - ≥18 years of age as of the index date (ie, first nHCM diagnosis).

### Enrollment

- Baseline enrollment: Continuous enrollment (CE) with medical and pharmacy benefits for 6 months prior to the index date.
- Follow-up enrollment: CE with medical and pharmacy benefits for ≥12 months after (and including) the index date.

### Exclusion criteria

- Patients with evidence of Fabry disease, amyloidosis, pharmacologic treatment for HCM or septal reduction therapy were excluded.
- Patients with missing age, gender, and/or unknown or "other" geographic region were excluded.

## Study Outcomes

- HCM-related HRU and costs (Consumer Price Index adjusted to 2022) were reported as mean (SD), including medical (ambulatory: office visit [OV], outpatient [OP] visits; emergency room [ER] visits; inpatient admissions [IA]; length of stay [LOS]; other medical costs) and pharmacy.
- HRU were presented as n (%) of patients with ≥1 visit, and costs were reported as mean ± SD.
- Outcomes were reported at baseline and 1-year follow-up.

## RESULTS

- Among 9842 patients with nHCM, 54% were male and mean age was 61 ± 16 years; 74% were non-Hispanic White; 42% were in the US Midwest (**Table 1**).
- Baseline clinical characteristics are shown in **Table 2**.
- The majority had Commercial insurance (50%), followed by Medicare (28%), Medicaid (8%), and Other insurance (14%) (**Table 1**).

**Table 1: Patient demographics**

Patient characteristic <sup>a</sup>	All nHCM (N=9842)
Age, mean ± SD, years	60.6 ± 16.2
Age group	
18–39	1149 (11.7)
40–54	1958 (19.9)
55–64	2380 (24.2)
65–74	2176 (22.1)
75+	2179 (22.1)
Female	4545 (46.2)
Insurance type	
Commercial	4922 (50.0)
Medicare	2790 (28.4)
Medicaid	754 (7.7)
Other	36 (0.4)
Unknown/missing	1340 (13.6)
US region	
Northeast	2763 (28.1)
Midwest	4152 (42.2)
South	2159 (21.9)
West	768 (7.8)
Race/ethnicity	
White, non-Hispanic	7306 (74.2)
Black/African American, non-Hispanic	1916 (19.5)
Asian, non-Hispanic	204 (2.1)
Hispanic	416 (4.2)

<sup>a</sup> Data are n (%) except where otherwise indicated. nHCM, non-obstructive hypertrophic cardiomyopathy.

**Table 2: Baseline clinical characteristics**

Patient characteristic <sup>a</sup>	All nHCM (N=9842)
CCI score (continuous), mean ± SD	1.36 ± 1.81
Baseline comorbidities	
Coronary artery disease	2269 (23.1)
Pulmonary hypertension	381 (3.9)
Hyperthyroidism	73 (0.7)
Hypothyroidism	1170 (11.9)
Bradyarrhythmia	595 (6.1)
Heart failure	1680 (17.1)
Chronic kidney disease	1181 (12.0)
Atrial fibrillation	1409 (14.3)
Hypertension	5338 (54.2)
Obstructive sleep apnea	1108 (11.3)
Diabetes, type 2	2222 (22.6)
Obesity	1658 (16.9)
Myocardial fibrosis	261 (2.7)
Diagnosing Provider's specialty	
Cardiologist	5037 (51.2)
Cardiovascular surgery	20 (0.2)
Primary care physician	1213 (12.3)
General practice	697 (7.1)
Others	1707 (17.3)

<sup>a</sup> Data are n (%) except where otherwise indicated. CCI, Carlson Comorbidity Index; nHCM, non-obstructive hypertrophic cardiomyopathy.

- Proportion of patients with HCM-related HRU increased from baseline vs 1-year follow-up for ambulatory (10% vs 84%), OV (8% vs 70%), OP (4% vs 39%), ER visits (2% vs 11%), IP admissions (3% vs 12%), and pharmacy (9% vs 10%) (**Figure 1**).

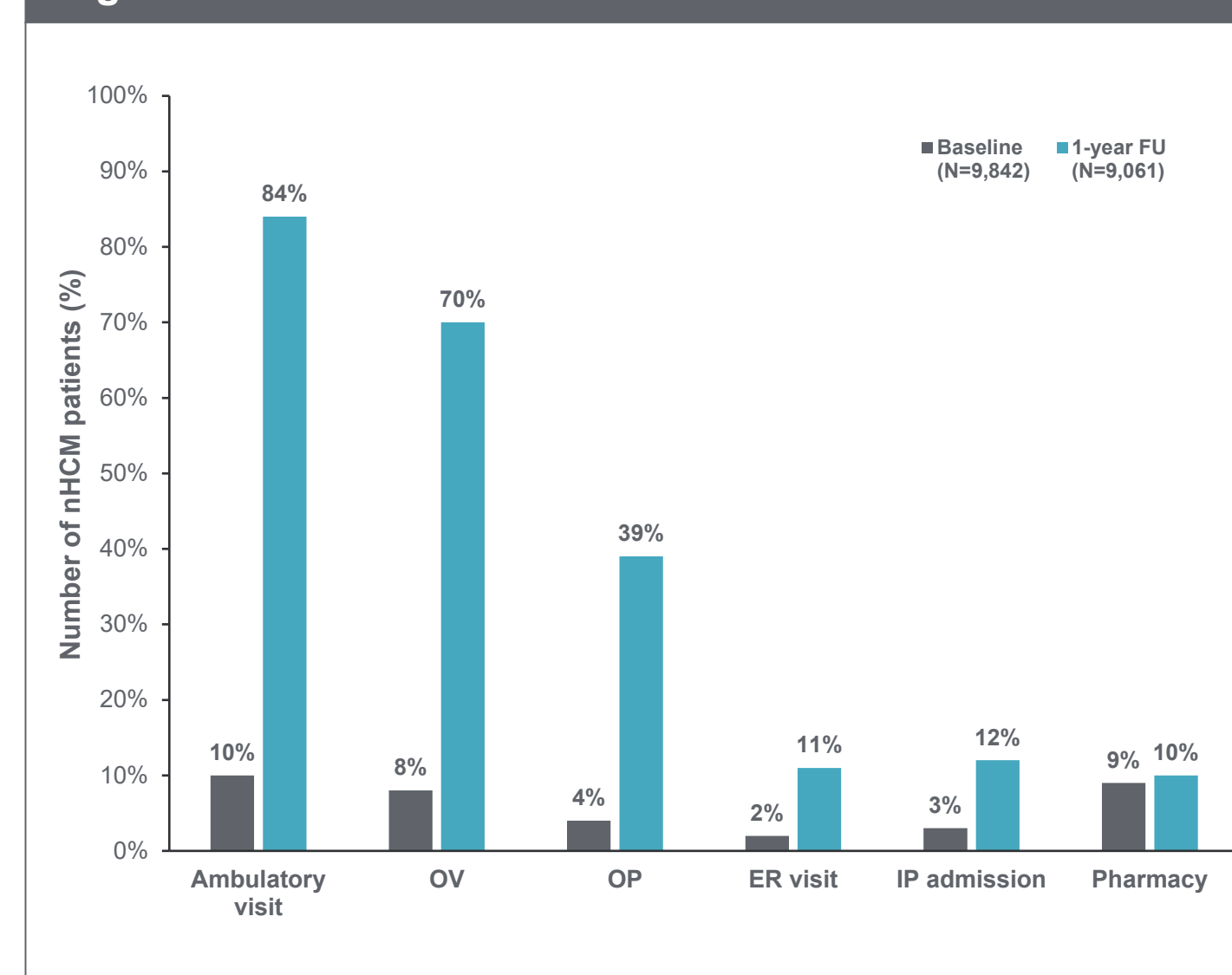
- Total medical costs increased from baseline vs 1-year follow-up (\$3,666 ± \$42,802 vs \$12,715 ± \$40,381;  $P < 0.001$ ), including ambulatory (\$227 ± \$3,078 vs \$2,963 ± \$12,627;  $P < 0.001$ ), OV (\$27 ± \$130 vs \$441 ± \$1,226;  $P < 0.001$ ), OP (\$200 ± \$3,055 vs \$2,522 ± \$12,472;  $P < 0.001$ ), and other medical costs (\$189 ± \$2,628 vs \$1,873 ± \$8,816;  $P < 0.001$ ) (**Figure 2**).

- Costs of IP admissions (\$3,232 ± \$42,388 vs \$7,708 ± \$36,127;  $P < 0.01$ ) and ER visits (\$17 ± \$250 vs \$171 ± \$911;  $P < 0.001$ ) also increased from baseline vs 1-year follow-up (**Figure 2**).

- Differences in pharmacy costs (\$6 ± \$63 vs \$7 ± \$61;  $P = 0.28$ ) increased from baseline vs 1-year follow-up but were generally very low.

- HCM-related total costs (medical and pharmacy) increased from baseline vs 1-year follow-up (\$3,672 ± \$42,802 vs \$12,722 ± \$40,382;  $P < 0.001$ ) (**Figure 2**).

**Figure 1: HCM-Related HRU**



ER, emergency room; FU, follow-up; HRU, healthcare resource utilization; IP, inpatient; nHCM, non-obstructive hypertrophic cardiomyopathy; OP, outpatient; OV, office visit.

## Limitations

- Real-world data in this study utilized ICD-9 and ICD-10 coding for disease identification and study outcomes, and may be subject to inconsistencies without patient-level genetic and anatomical confirmation.
- Due to the descriptive nature of this study, these results only include unadjusted analyses.

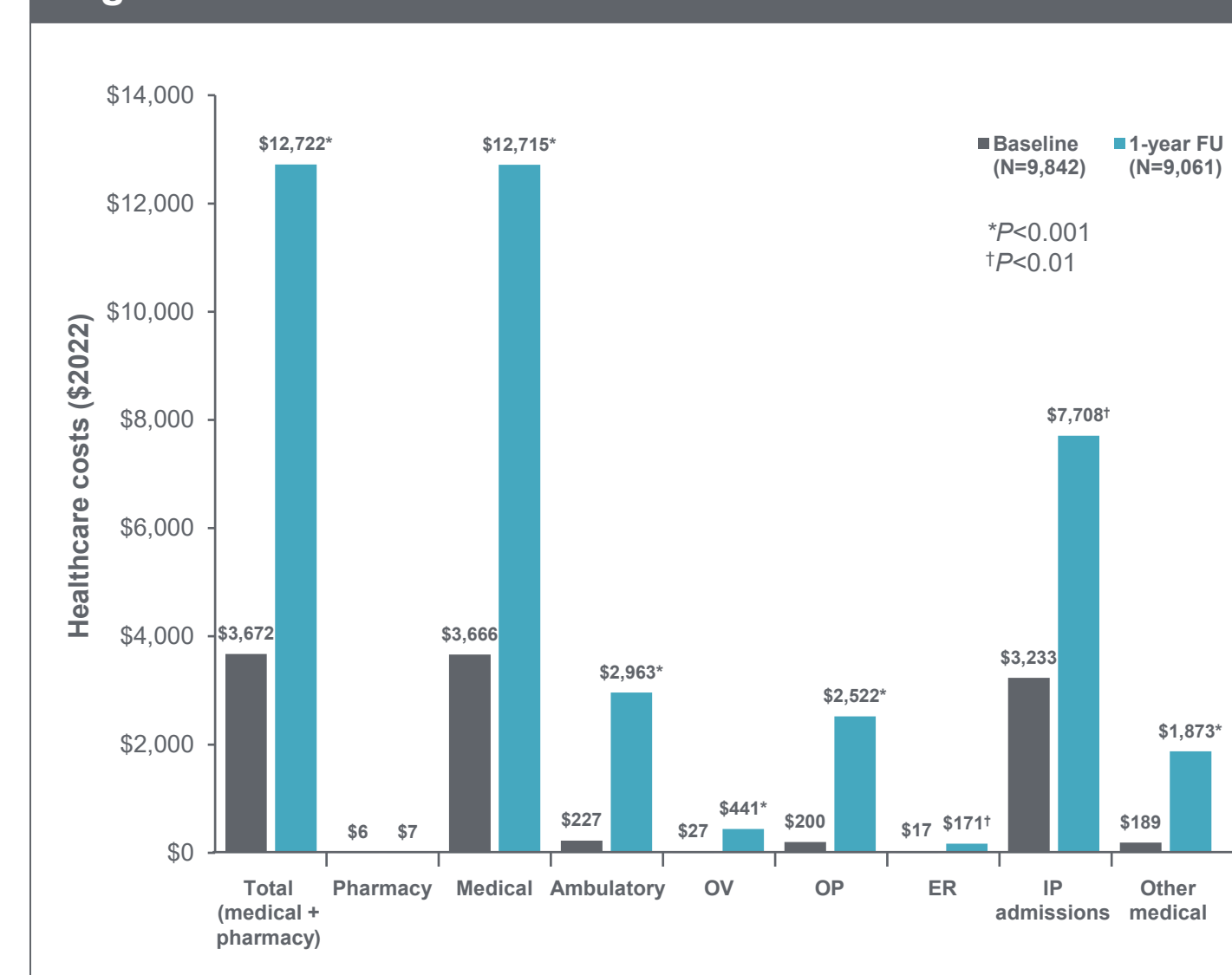
## REFERENCE

1. Butzner M, et al. *Am J Cardiol* 159:107-12.

## DISCLOSURES

MB, PG, SS: Employees of and own stock in Cytokinetics, Incorporated. KB, QA, AB: Employees of Optum/UHG, which was a consultant to Cytokinetics, Incorporated for this study. QA, AB, AA: Shareholders of UHG stock. NR: Consulting/speaking honoraria: Roche Diagnostics and Zoll, Inc.; supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number K23HL166961 (the content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health). AO: Consultant/advisor fees: Bristol Myers Squibb/MyoKardia, Cytokinetics, Incorporated, and Pfizer.

**Figure 2: HCM-Related Costs**



ER, emergency room; FU, follow-up; HCM, hypertrophic cardiomyopathy; IP, inpatient; OP, outpatient; OV, office visit.

## CONCLUSIONS

- In a large, national cohort of patients with nHCM, disease-related HRU and costs across all categories increased over a 1-year period, driven by medical costs and IP admissions.
- A diagnosis of nHCM carries a notable cost of care and future interventions to reduce this burden for patients with nHCM is warranted.

## ACKNOWLEDGMENTS

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