



# Cytokinetics

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## Long-term Healthcare Costs and Utilization Among Patients With Non-Obstructive Hypertrophic Cardiomyopathy

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# Conflict of Interest Statement

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- This study was funded by Cytokinetics, Incorporated.
- **MB, PG,** and **SS** are employees of and own stock in Cytokinetics, Incorporated.
- **KB, QA,** and **AB** are employees of Optum/UHG, who were consultants for Cytokinetics, Incorporated, for this study. **QA** and **AB** are also shareholders of UHG stock.
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# Introduction

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- Hypertrophic cardiomyopathy (HCM) is the most common genetic cardiomyopathy,<sup>1</sup> with an estimated average prevalence of 1 in 1250 people in the USA.<sup>2</sup>
- Non-obstructive HCM (nHCM) is the fastest growing subset of patients with HCM.<sup>2</sup>
- There is limited evidence on the economic burden for patients with nHCM, and those studies have been limited to short periods of follow-up.

## Objective

- Analyze cumulative healthcare resource utilization (HRU) and costs for patients with nHCM over a 5-year follow-up period.

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1. Authors/Task Force members, et al. Eur Heart J 2014;35:2733-79. 2. Butzner M, et al. Am J Cardiol 2021;159:107-12.

# Methods

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## Study Design

- Retrospective cohort study of adult patients with nHCM in Optum's Market Clarity database from 1/1/2013 through 12/31/2021 (Index date = first nHCM diagnosis).
- Market clarity includes administrative claims and electronic medical record data.

## Inclusion criteria

- $\geq 18$  years of age as of the index date.
- $\geq 2$  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  $\geq 30$  days apart during the patient identification period.
- Baseline continuous enrollment (CE) with medical and pharmacy benefits for 6 months prior to the index date.
- Follow-up CE with medical and pharmacy benefits for  $\geq 6$  months after (and including) the index date.

## Exclusion criteria

- Medical claim of obstructive HCM (ICD-9: 425.1; ICD-10: I42.1).
- Septal reduction therapy (alcohol septal ablation and septal myectomy) during the study period and pharmacotherapy during baseline period.
- Patients with Fabry disease or amyloidosis during the study period.
- Patients with missing age, gender, and unknown or "other" geographic region.

## Study Outcomes

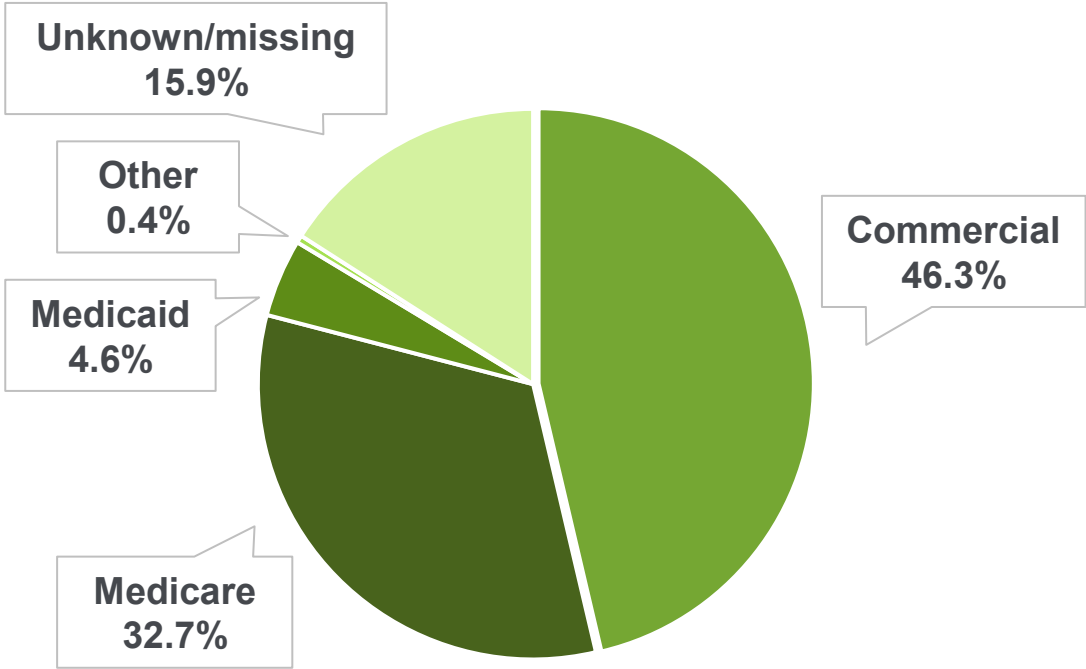
- CV-related HRU and costs (CPI adjusted to 2022) were reported as mean (SD), including medical (ambulatory: office visit, outpatient visits; ER visit; inpatient admissions; length of stay; other medical costs) and pharmacy.
- Outcomes were assessed at baseline (N=9842) and 5-year follow-up (n=3652).

CPI, Consumer Price Index; CV, cardiovascular; ER, emergency room; HCM, hypertrophic cardiomyopathy; HRU, healthcare resource utilization; ICD, International Classification of Disease; nHCM, non-obstructive hypertrophic cardiomyopathy.

# Results: Patient demographics

## Among 3652 patients with nHCM:

- 46% were female
- Mean age, 63.0 ± 15.5 years
- 77.8% were non-Hispanic White
- 46.3% had Commercial insurance



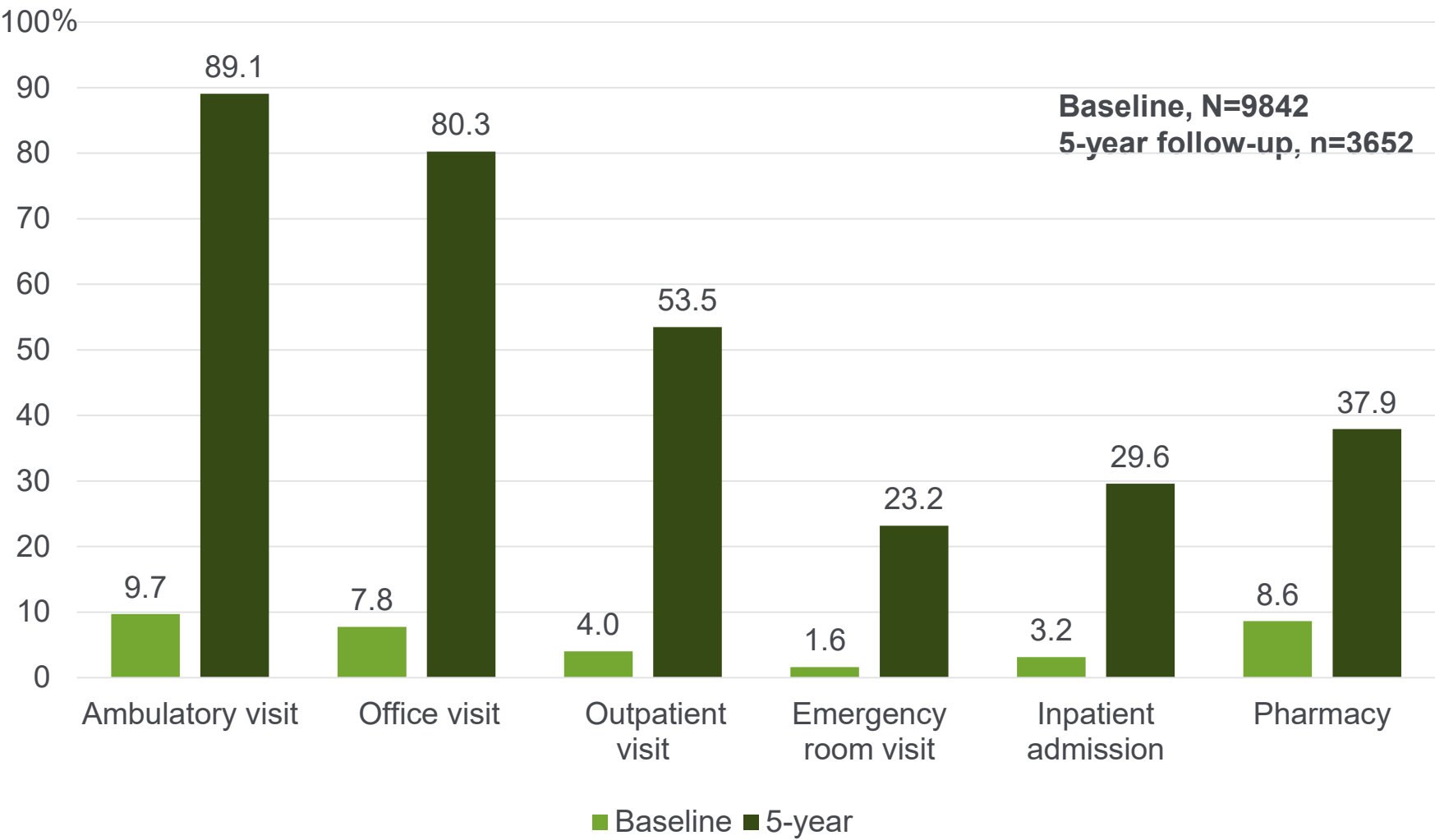
nHCM, non-obstructive hypertrophic cardiomyopathy.

Demographics	Patient with nHCM n=3652
Age, continuous, mean (SD), y	63.0 (15.5)
Age group, n (%)	
18–39 y	308 (8.4)
40–54 y	681 (18.7)
55–64 y	777 (21.3)
65–74 y	873 (23.9)
75+ y	1013 (27.7)
Gender, n (%)	
Female	1666 (45.6)
Male	1986 (54.4)
US region, n (%)	
Northeast	1174 (32.2)
Midwest	1418 (38.8)
South	773 (21.2)
West	287 (7.9)
Race/ethnicity, n (%)	
White, non-Hispanic	2841 (77.8)
Black/African American, non-Hispanic	618 (16.9)
Asian, non-Hispanic	69 (1.9)
Hispanic	124 (3.4)

# Results: CV-related healthcare resource utilization

**At 5-year follow-up:**

- Ambulatory visits: 89.1%:
  - Office visit: 80.3%
  - OP visit: 53.5%
- ER visit: 23.2%
- IA: 29.6%
- Prescription fill: 37.9%



CV, cardiovascular; ER, emergency room; IA, inpatient admission; OP, outpatient.

## Results: CV-related healthcare resource utilization

### At 5-year follow-up, mean (SD):

- Ambulatory visit: 11.2 (13.8)
- ER visit: 0.5 (1.5)
- IA: 0.7 (2.3)
  - LOS: 7.8 (38.2) days

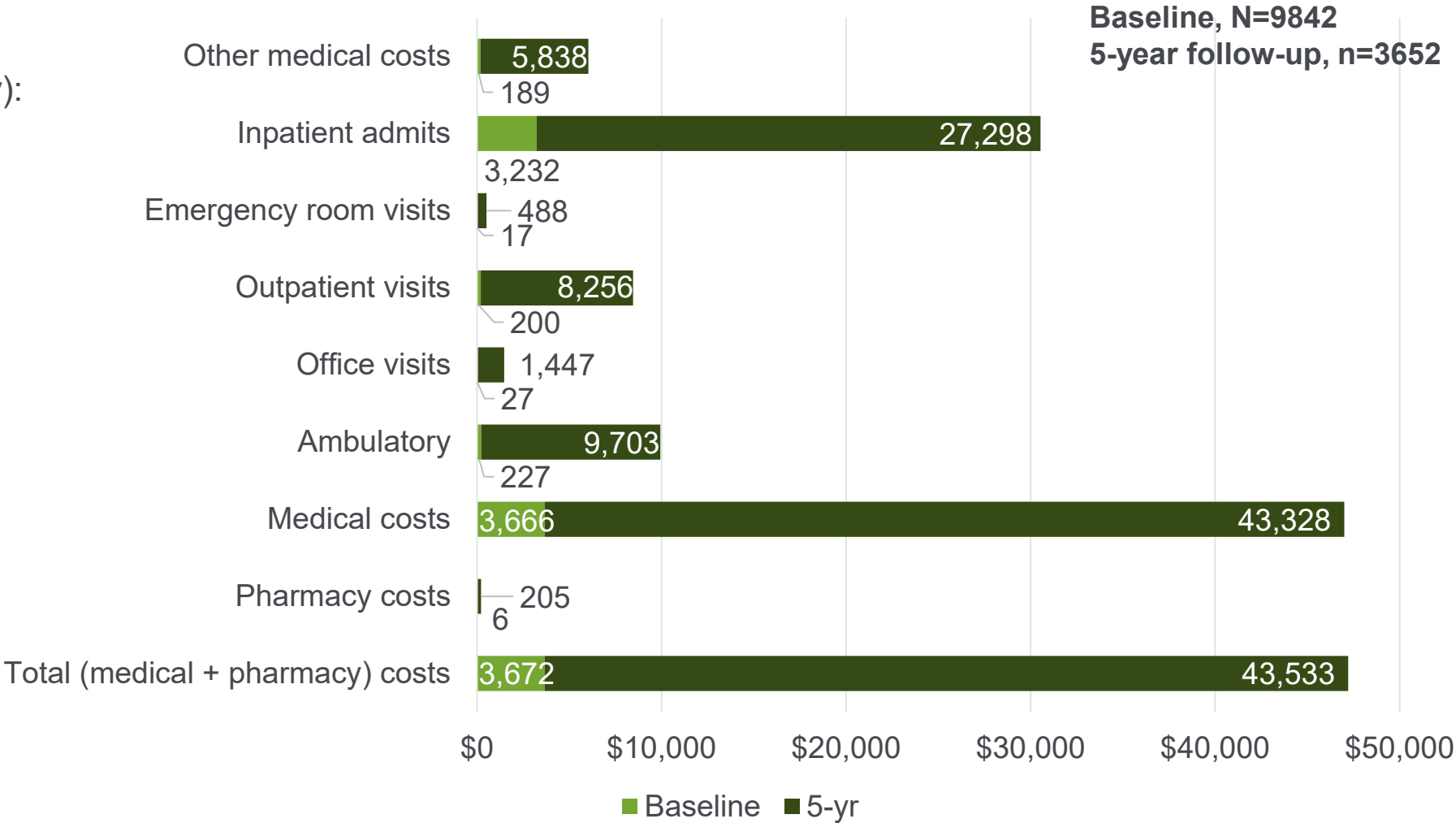
Mean (SD)	Baseline N=9842	5-year follow-up n=3652
Ambulatory visits	0.3 (1.1)	11.2 (13.8)
Office visits	0.2 (0.7)	7.3 (9.4)
Outpatient visits	0.1 (0.7)	3.9 (8.6)
Emergency room visits	0.0 (0.2)	0.5 (1.5)
Inpatient admits	0.0 (0.2)	0.7 (2.3)
Length of stay, days	1.0 (15.8)	7.8 (38.2)
Pharmacy use	0.2 (0.8)	4.9 (11.1)

CV, cardiovascular; ER, emergency room; IA, inpatient admission; LOS, length of stay.

# Results: CV-related healthcare costs

## Costs<sup>a</sup>, mean (SD)

- Total (medical + pharmacy):  
\$43,533 (\$101,631)
- Medical costs:  
\$43,328 (\$101,600)
  - Ambulatory visit:  
\$9,703 (\$25,527)
  - ER visit:  
\$488 (\$2,057)
  - IA:  
\$27,298 (\$88,547)
  - Other medical:  
\$5,838 (\$18,544)
- Pharmacy:  
\$205 (\$927)



<sup>a</sup> \$2022 CPI.  
CV, cardiovascular; ER, emergency room; IA, inpatient admission.



# Limitations

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- Real-world data in this study utilized ICD-9 and ICD-10 coding for disease identification, patient demographics, HRU and costs, and may be subject to inconsistencies without patient-level genetic and anatomical confirmation.
- The study period consisted almost a decade of claims data, during which medical coding transitioned from ICD-9 to ICD-10. Given the greater granularity and improved specificity of ICD-10 codes compared with ICD-9 codes, it is anticipated that the degree of misclassification might be higher among patients identified prior to October 2015.
- Proxy claims-based definition was developed to identify HCM as well as nHCM patients.
- The presence of a claim for a prescription fill is an assumption that the medication was consumed or taken as prescribed. We are unable to discern whether medications are taken as prescribed in an administrative claims database.
- Due to the descriptive nature of this study, no analyses were conducted for adjustment of covariates.

HCM, hypertrophic cardiomyopathy; HRU, healthcare resource utilization; ICD, International Classification of Disease; nHCM, non-obstructive hypertrophic cardiomyopathy.

# Conclusions

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- **Patients with nHCM experience significant HRU leading to increased costs of care, with about one fourth of patients with an ER visit and IA.**
- **Innovative treatment options to reduce this economic burden and improve patient outcomes are urgently needed for patients with nHCM.**

ER, emergency room; HRU, healthcare resource utilization; IA, inpatient admission; nHCM, non-obstructive hypertrophic cardiomyopathy.

## Contact Information

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