# Healthcare Resource Utilization Burden of Patients with Hypoparathyroidism in the United States

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## INTRODUCTION

- Hypoparathyroidism (HP) is a rare endocrine disorder characterized by insufficient or dysfunctional parathyroid hormone (PTH).
- The healthcare burden of chronic HP (cHP) can be significant due to the chronic nature of the condition and its impact on multiple organ systems.
- The goal of this study was to better understand healthcare resource utilization patterns and associated costs for patients with cHP, using a cohort of patients with transient HP (tHP) as a reference.

## METHODS

- **Study Design:** Non-interventional retrospective claims data analysis
- **Data Source:** HealthVerity closed payer claim medical and pharmacy database (Private Source 20) with 130 million covered lives
- **Study Period:** October 1, 2014 - December 31, 2019
- **Study Population:** Incident and prevalent patients identified with HP; Eligibility criteria were adapted from a study by Powers et al. (1) and defined under the guidance of clinicians experienced in treating patients with cHP; Patients were continuously enrolled ≥1 year pre- and post-index

**cHP Cohort**

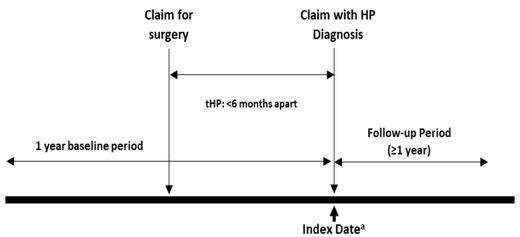
  - Patients having a claim for parathyroidectomy, complete or partial thyroidectomy, or neck dissection, followed by a claim with an HP diagnosis 6-15 months later, and a second HP diagnosis claim at any subsequent time point

**tHP Cohort (reference group)**

  - Patients having a claim for parathyroidectomy, complete or partial thyroidectomy, or neck dissection, followed by a claim with a diagnosis of HP within 6 months of the procedure, with no HP diagnosis claim before the procedure and 6 months after the procedure

- **Analysis:** All outcomes were assessed up to one year from the index date; Baseline characteristics and outcomes were compared using descriptive statistics

### Figure 1. Study Period




*[a]cHP Index Date: defined as the date of the first qualifying HP diagnosis claim*
*tHP Index Date: defined as the date of the last HP diagnosis claim*

## RESULTS

### Baseline Characteristics

- A total of 2,179 individuals met study inclusion criteria and were further divided into two cohorts at Index: cHP (N=1,406) and tHP (N=773) (**Table 1**).
- The average age (52.1 years cHP; 53.5 years tHP) and representation of females (83.2% cHP; 81.2% tHP) were similar for both cohorts. Neck dissection surgery was more prevalent in cHP patients (23.6%) than tHP patients (5.3%).

### Table 1. Baseline Characteristics

| | cHP Cohort N=1,406 | tHP Cohort N=773 |
|---|---|---|
| **Female, n (%)** | 1,170 (83.2%) | 624 (81.2%) |
| **Age (Years), Mean (SD)** | 52.1 (16.4) | 53.5 (14.9) |
| **CCI, Mean (SD)** | 4.1 (3.6) | 3.3 (3.3) |
| **Insurance type, n (%)** | | |
| Commercial | 743 (52.8%) | 452 (58.5%) |
| Medicaid | 397 (28.3%) | 204 (26.4%) |
| Medicare Advantage | 220 (15.7%) | 87 (11.3%) |
| Unknown | 42 (2.9%) | 30 (3.%) |
| **Procedures, n (%)** | | |
| Parathyroidectomy | 368 (26.2%) | 286 (37.0%) |
| Neck dissection | 332 (23.6%) | 39 (5.1%) |
| Thyroidectomy | 706 (50.2%) | 448 (57.9%) |

### All-Cause Resource Utilization

- In the year post-index, the proportion of patients with all-cause emergency department visits was 32.7% in the cHP cohort compared to 29.1% in the tHP cohort, while the proportion of patients with office visits and hospitalizations were nearly equal between the cohorts (**Table 2**).
- Between year 1 to 2 post-index, the proportion of patients in the cHP cohort with an inpatient admission was 17.4% and 26.0% had an emergency visit compared to 14.4% and 21.4%, respectively, in the tHP cohort. The average number of hospitalizations were ~1.5x higher in the cHP cohort.

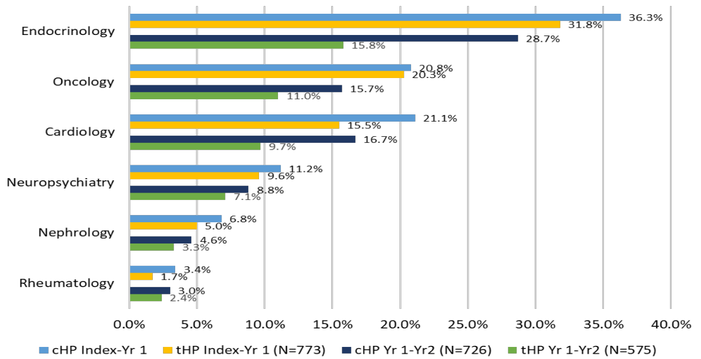
### Table 2. All-Cause Resource Utilization

| | cHP Cohort | | tHP Cohort | |
|---|---|---|---|---|
| | Follow-up Index-1 year N=1,184 | Follow-up 1-2 year N=726 | Follow-up Index-1 year N=773 | Follow-up 1-2 year N=575 |
| **Proportion of Patients with All-Cause Resource Utilization, n(%)** | | | | |
| Inpatient Hospital | 303 (25.6%) | 126 (17.4%) | 194 (25.1%) | 83 (14.4%) |
| Office/Clinic | 1139 (96.2%) | 672 (92.6%) | 748 (96.8%) | 504 (87.7%) |
| Emergency Room | 387 (32.7%) | 189 (26.0%) | 225 (29.1%) | 123 (21.4%) |
| Urgent Care | 96 (8.1%) | 54 (7.4%) | 60 (7.8%) | 52 (9.0%) |
| **Frequency of All-Cause Resource Utilization, Mean (SD)** | | | | |
| Inpatient Hospital | 2.2 (8.9) | 1.4 (6.2) | 1.7 (6.4) | 0.8 (3.4) |
| Office/Clinic Visit | 16.7 (18.9) | 15.2 (20.3) | 16.0 (21.9) | 12.5 (17.1) |
| Emergency Room | 1.1 (3.1) | 0.8 (2.2) | 0.7 (2.0) | 0.5 (1.6) |
| Urgent Care | 0.2 (0.6) | 0.1 (0.5) | 0.1 (0.7) | 0.1 (0.5) |

### All-Cause Provider Resource Utilization

- Despite similar proportions and frequencies of office/clinic visits, patients in the cHP cohort had more specialty provider visits during the first year post-index (**Figure 2**).
- The variety of specialty providers seen by the cHP cohort continued at a higher frequency in the year 1 to 2 post-index.

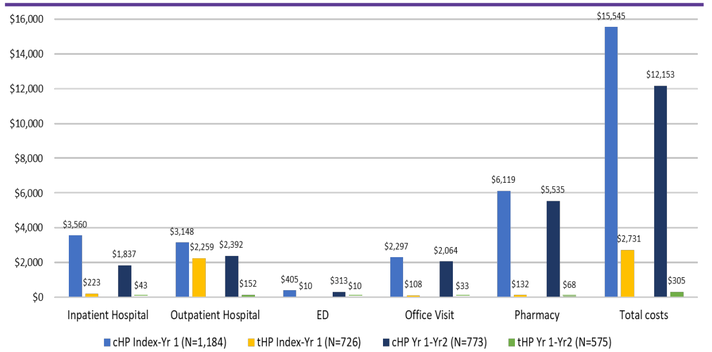
### Figure 2. Provider Type for Resource Utilization




### All-Cause Costs

- The cHP cohort had nearly 5 times the mean (SD) unadjusted total all-cause costs compared with the tHP cohort during the first year post-index: $15,545 ($27,902) versus $2,731 ($27,677), respectively (**Figure 3**).
- These costs remained higher for the cHP cohort compared to the tHP between years 1 and 2 post-index ($12,153 [SD $22,341], $305 [SD $1,585], respectively).

### Figure 3. All-Cause Healthcare Resource Costs




## CONCLUSIONS

- This study demonstrates that the burden of cHP is significant for individuals and US healthcare systems and these costs could continue to accumulate over a person's lifetime.
- It was observed that the chronicity of HP appears to contribute to higher utilization of healthcare services and incurred healthcare costs.
- Throughout the study period, the cHP cohort experienced nearly double the number of all-cause emergency room visits and inpatient hospitalizations compared to the tHP cohort.
- The strength of this study lies in the inclusiveness of the U.S. HP patient population and the rigorous eligibility criteria for the identification of cHP patients. Limitations that are common among claims analysis studies also apply to the present study. Additionally, the costs are not directly linked to HP and may be due to the comorbidities of this population
- Continued efforts in research, clinical trials, education, and advocacy are crucial to improving the diagnosis, treatment, and overall care for individuals with hypoparathyroidism, and help reduce the economic impact of the condition.
- Future studies are required to better understand the economic impact associated with cHP complications and comorbidities, and to investigate ways to reduce overall burden of disease and costs associated with cHP.

## REFERENCES

**1.** Powers J, et al. *J Bone Miner*. 2013;28(12):2570-6; **2.** Levy I, et al. J *Clin Endocrinol Metab*. 2015;100(11):4106-4113; **3.** Siggelkow H, et al. *Clin Endocrinol (Oxf)*. 2020;92(2):159-68; **4.** David K, et al. *Eur J Endocrinol*. 2019;180(1):71-78; **5.** Chen K, et al. *J Med Econ*. 2019;22(11):1141-1152; **6.** Vadiveloo T, et al. *Clin Endocrinol (Oxf)*. 2019;90(2):285-292.

## DISCLOSURES

Study was funded by Amolyt Pharma. NL, PL, MDC, SA and BW are current employees of Amolyt Pharma. KLD is an employee of EPI-Q Inc., which received payment from Amolyt Pharma associated with the development and execution of this study. DMM is an employee of MGH and received payment from Amolyt Pharma as an advisor for this study.

**Abbreviations:** CCI: Charleson Comorbidity Index; cHP: Chronic Hypoparathyroidism; CKD: Chronic Kidney Disease; ED: Emergency Department; eGFR: Estimated Glomerular Filtration Rate; ESRD: End-Stage Renal Disease; HP: Hypoparathyroidism; SD: Standard Deviation; tHP: Transient Hypoparathyroidism; Yr: Year