# Prevalence and Economic Burden of Dysphagia in Patients With Chronic Lymphocytic Leukemia and Waldenström Macroglobulinemia

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# OBJECTIVE

To assess the annual prevalence of dysphagia, healthcare resource utilization (HCRU), and costs in patients with chronic lymphocytic leukemia (CLL) and Waldenström macroglobulinemia (WM) using real-world data

## CONCLUSIONS

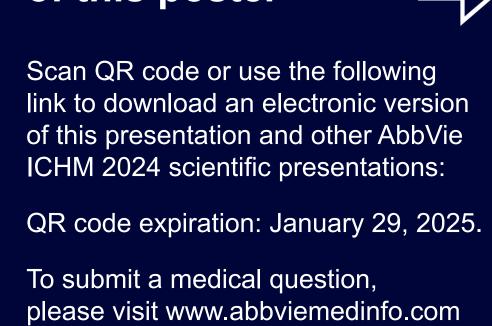
Rates of dysphagia in older adults with CLL or WM were slightly higher than in the general population

Factors contributing to the higher economic burden faced by patients with dysphagia include the frequency of inpatient hospitalizations, use of skilled nursing facilities, and physician visits

Medication administration challenges may contribute to increased HCRU and costs in patients with dysphagia

Implementation of alternative dosing formulations for patients with CLL or WM and dysphagia may decrease health-related costs

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INTRODUCTION

- Dysphagia, or difficulty swallowing, affects up to 1 in 6 adults and is a common condition among older adults<sup>1</sup>
- Dysphagia can lead to additional health complications and reduced adherence to oral therapies, and may negatively impact quality of life and treatment outcomes<sup>1</sup>
- The ability to swallow medications safely and efficiently may be impaired in older, frail patients; however, crushing or chewing capsules can alter drug absorption and may potentially lead to harm<sup>2–4</sup>
- Patients with chronic lymphocytic leukemia (CLL) and Waldenström macroglobulinemia (WM) are predominantly older adults and may have a higher risk of swallowing difficulties<sup>1</sup>
- Here we assessed the annual prevalence of dysphagia, healthcare resource utilization (HCRU), and costs in patients with CLL and WM using realworld data

## **METHODS**

- In this retrospective study, annual prevalence of dysphagia in older adults (≥65 years), HCRU, and costs from January 2014 to December 2022 were assessed using data from Optum Clinformatics Data Mart
- Annual prevalence was calculated in a general cohort by dividing the number of continuously enrolled (CE) patients with dysphagia by the total number of CE individuals in the health plan for the specific year
- Similarly, annual prevalence was calculated in CLL and WM cohorts by dividing the numbers of CE patients
  with CLL or WM who have dysphagia by the total numbers of CE patients with CLL or WM in the health plan
  in the specific year
- All-cause HCRU and costs per patient per month (PPPM) were assessed among patients with and without dysphagia after CLL or WM diagnosis
- Presence of dysphagia was defined by occurrence of a dysphagia medical claim within a 2-year period preceding a CLL or WM diagnosis
- The follow-up period was defined as the time of CLL or WM diagnosis to end of data or enrollment
- Univariate statistical tests (i.e., *t* tests/Mann-Whitney U tests for continuous variables and chi-square test for categorical variables) were used to assess differences in baseline characteristics and study outcomes between dysphagia and nondysphagia groups
- Multivariable models (ie, negative binomial model for HCRU and generalized linear model with log link and gamma distribution for costs) were used to adjust for baseline differences between the dysphagia and nondysphagia groups

## RESULTS

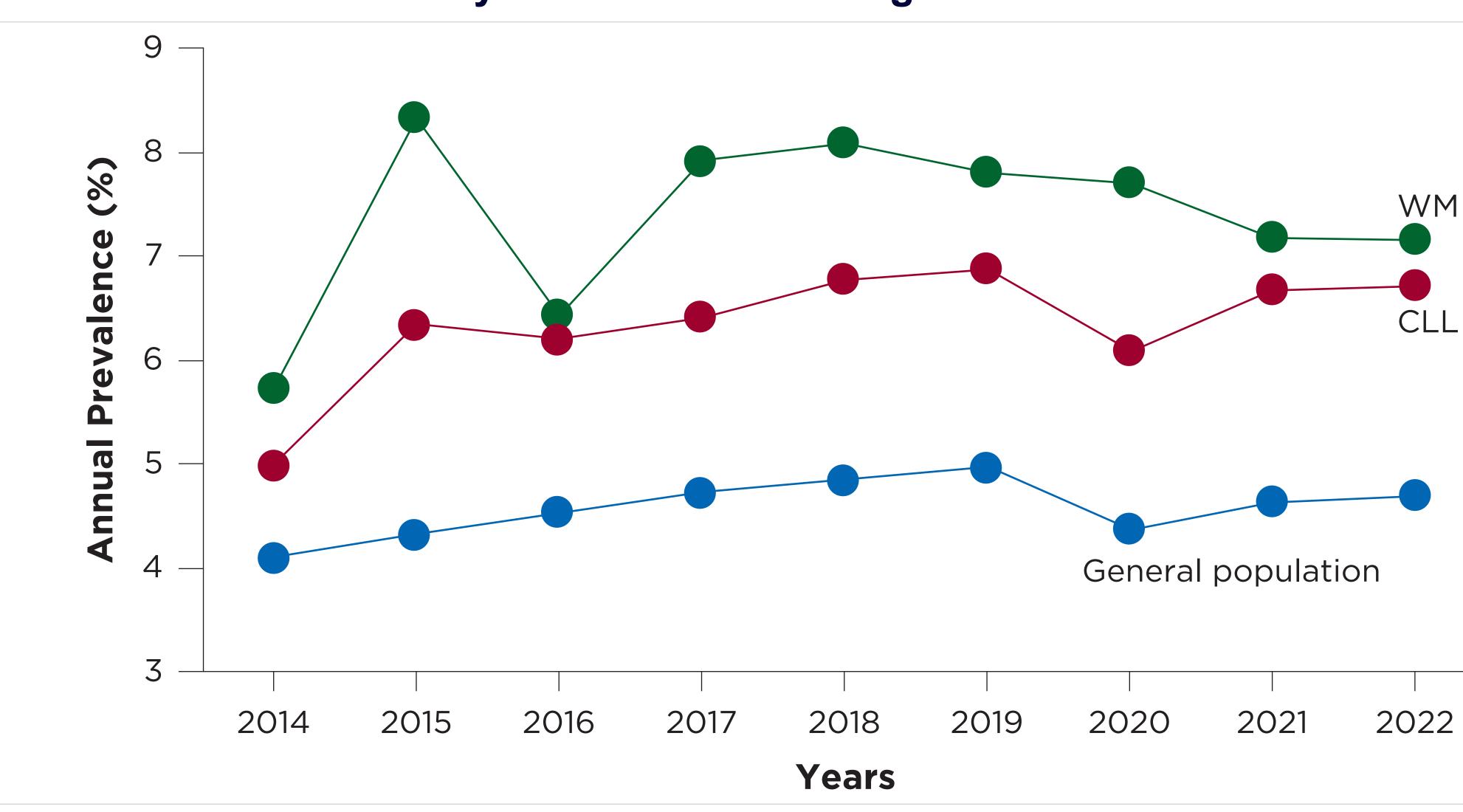
Among CLL and WM Cohorts, Baseline Characteristics of Age and Medication Burden Differed Between Patients With and Without Dysphagia

|  | CLL                           |                                   | WM      |                              |                                  |         |
|--|-------------------------------|-----------------------------------|---------|------------------------------|----------------------------------|---------|
|  | Patients With Dysphagia n=270 | Patients Without Dysphagia n=4147 | P Value | Patients With Dysphagia n=30 | Patients Without Dysphagia n=246 | P Value |
| Age, mean (SD) [median], years               | 75.0 (8.4)<br>[75]            | 73.8 (9.2)<br>[74]                | 0.02    | 77.9 (8.2)<br>[79]           | 73.6 (9.1)<br>[74]               | 0.01    |
| Sex, n (%)                                   |                               |                                   | 0.22    |                              |                                  | 1.00    |
| Female                                       | 133 (49)                      | 1876 (45)                         |         | 13 (43)                      | 111 (45)                         |         |
| Male   | 137 (51)                      | 2271 (55)                         |         | 17 (57)                      | 135 (55)                         |         |
| Race/ethnicity, n (%) <sup>a</sup>           |                               |                                   | 0.59    |                              |                                  | 0.66    |
| White  | 223 (84)                      | 3377 (85)                         |         | 24 (86)                      | 201 (84)                         |         |
| Black or African American                    | 22 (8)                        | 254 (6)                           |         | 2 (7)                        | 13 (5)                           |         |
| Hispanic or Latino                           | 18 (7)                        | 282 (7)                           |         | 2 (7)                        | 13 (5)                           |         |
| Asian  | 2 (1)                         | 55 (1)                            |         | 0                            | 12 (5)                           |         |
| Region, n (%) <sup>a</sup>                   |                               |                                   | 0.44    |                              |                                  | 0.73    |
| South  | 96 (36)                       | 1480 (36)                         |         | 11 (37)                      | 71 (29)                          |         |
| West   | 87 (32)                       | 1166 (28)                         |         | 10 (33)                      | 90 (37)                          |         |
| Midwest                                      | 54 (20)                       | 959 (23)                          |         | 6 (20)                       | 44 (18)                          |         |
| Northeast                                    | 33 (12)                       | 540 (13)                          |         | 3 (10)                       | 41 (16)                          |         |
| Insurance payor, n (%)                       |                               |                                   | 0.01    |                              |                                  | 0.09    |
| Medicare                                     | 248 (92)                      | 3571 (86)                         |         | 1 (3)                        | 38 (15)                          |         |
| Commercial                                   | 22 (8)                        | 576 (14)                          |         | 29 (97)                      | 208 (85)                         |         |
| CCI score, mean (SD) [median]                | 3.2 (1.7)<br>[3.0]            | 2.7 (1.4)<br>[2.0]                | <0.0001 | 3.6 (2.1)<br>[3.5]           | 2.9 (1.5)<br>[2.0]               | 0.08    |
| Medication burden,<br>mean (SD) <sup>b</sup> | 38.4 (36.9)                   | 23.8 (24.2)                       | <0.0001 | 35.4 (22.3)                  | 25.5 (24.4)                      | 0.03    |

#### CI, Charlson Comorbidity Index.

<sup>a</sup>Numbers do not add up to the total n value due to missing values for race/ethnicity or region. <sup>b</sup>Based on number of prescriptions.

# Annual Prevalence Rates of Dysphagia in an Older General Population and in CLL and WM Cohorts Were ~5%, ~6%, and ~7%, respectively, and Stayed Consistent During the 9-Year Period



# All-Cause HCRU PPPM Was Significantly Higher Among Patients With CLL and Dysphagia Compared With Those Without Dysphagia

| Visits, mean (SD) [median] | Patients With Dysphagia n=269 <sup>a</sup> | Patients Without Dysphagia n=4122 <sup>b</sup> | <i>P</i> Value <sup>c</sup> |
|----------------------------|--|--|-----------------------------|
| All-cause total visits     | 6.78 (4.90) [6]                            | 5.01 (4.76) [4]                                | <0.0001                     |
| Emergency department       | 0.53 (0.51) [1]                            | 0.36 (0.48) [0]                                | <0.0001                     |
| Inpatient                  | 0.47 (0.52) [0]                            | 0.35 (0.54) [0]                                | <0.0001                     |
| Outpatientd                | 1.09 (0.81) [1]                            | 1.07 (1.03) [1]                                | 0.31                        |
| Physician officed          | 1.79 (1.39) [2]                            | 1.64 (1.44) [1]                                | 0.01                        |
| Skilled nursing facilities | 0.09 (0.28) [0]                            | 0.05 (0.23) [0]                                | 0.03                        |

<sup>a</sup>1 patient with negative costs was excluded from the dataset. b25 patients with negative costs were excluded from the dataset. Based on unadjusted analyses. Constitution of the dataset of the dataset

# All-Cause Costs PPPM Were Also Significantly Higher Among Patients With CLL and Dysphagia Compared With Those Without Dysphagia

| Costs (USD), mean (SD) [median] | Patients With Dysphagia n=269 <sup>a</sup> | Patients Without Dysphagia n=4122 <sup>b</sup> | <i>P</i> Value <sup>c</sup> |
|---------------------------------|--|--|-----------------------------|
| All-cause total costs           | 4410 (14,206) [1588]                       | 2758 (16,773) [778]                            | <0.0001                     |
| Emergency department            | 237 (519) [41]                             | 113 (388) [0]                                  | <0.0001                     |
| Inpatient                       | 2901 (13,757) [0]                          | 1711 (16,514) [0]                              | <0.0001                     |
| Outpatientd                     | 664 (1508) [234]                           | 538 [173]                                      | 0.02                        |
| Physician office <sup>d</sup>   | 311 (394) [202]                            | 261 (336) [177]                                | 0.04                        |
| Skilled nursing facilities      | 107 (569) [0]                              | 43 (371) [0]                                   | 0.02                        |
| Pharmacy                        | 1600 (4769) [150]                          | 1271 (3540) [74]                               | 0.0002                      |
|                                 |  |  | <u> </u>                    |

al patient with negative costs was excluded from the dataset. b25 patients with negative costs were excluded from the dataset. Based on unadjusted analyses.

dOutpatient visits included clinic, rehabilitation, psychiatric, or surgical visits at outpatient hospital sites. Physician office visits included independent office visits only

# Patients With WM and Dysphagia Had Significantly Higher All-Cause HCRU PPPM

| Visits, mean (SD) [median]    | Patients With Dysphagia n=30 | Patients Without Dysphagia n=245 <sup>a</sup> | P Value <sup>b</sup> |
|-------------------------------|------------------------------|---|----------------------|
| All-cause total visits        | 7.27 (4.50) [6]              | 5.34 (4.63) [4]                               | 0.004                |
| Emergency department          | 0.57 (0.50) [1]              | 0.40 (0.49) [0]                               | 0.08                 |
| Inpatient                     | 0.50 (0.51) [0.5]            | 0.35 (0.48) [0]                               | 0.10                 |
| Outpatient <sup>c</sup>       | 1.53 (1.28) [1]              | 1.18 (0.95) [1]                               | 0.16                 |
| Physician office <sup>c</sup> | 2.13 (1.38) [2]              | 1.79 (1.09) [2]                               | 0.10                 |
| Skilled nursing facilities    | 0.17 (0.38) [0]              | 0.05 (0.22) [0]                               | 0.02                 |

al patient with negative costs was excluded from the dataset. Based on unadjusted analyses. Outpatient visits included clinic, rehabilitation, psychiatric, or surgical visits at outpatient hospital sites. Physician office visits included independent office visits only.

# Patients With WM and Dysphagia Had Significantly Higher All-Cause Costs PPPM

| Costs (USD), mean (SD) [median] | Patients With Dysphagia n=30 | Patients Without Dysphagia n=245 <sup>a</sup> | <i>P</i> Value <sup>b</sup> |
|---------------------------------|------------------------------|---|-----------------------------|
| All-cause total costs           | 3039 (4442) [1866]           | 2114 (3360) [1008]                            | 0.03                        |
| Emergency department            | 223 (451) [40]               | 157 (471) [0]                                 | 0.08                        |
| Inpatient                       | 1210 (3428) [55]             | 927 (2588) [0]                                | 0.19                        |
| Outpatient <sup>c</sup>         | 937 (1325) [376]             | 566 (945) [231]                               | 0.13                        |
| Physician office <sup>c</sup>   | 386 (398) [271]              | 293 (281) [203]                               | 0.33                        |
| Skilled nursing facilities      | 114 (335) [0]                | 55 (358) [0]                                  | 0.02                        |
| Pharmacy                        | 2939 (6180) [419]            | 2390 (5009) [249]                             | 0.47                        |

<sup>a</sup>1 patient with negative costs was excluded from the dataset. <sup>b</sup>Based on unadjusted analyses. <sup>c</sup>Outpatient visits included clinic, rehabilitation, psychiatric, or surgical visits at outpatient hospital sites. Physician office visits included independent office visits only.

- Adjusted analysis showed that all-cause HCRU and costs increased by 8% (*P*=0.03) and 44% (*P*<0.0001), respectively, for patients with CLL and dysphagia compared with patients with CLL without dysphagia, while controlling for other covariates in the model
- Adjusted analysis showed that all-cause HCRU and costs increased by 25% (*P*=0.03) and 33% (*P*=0.16), respectively, for patients with WM and dysphagia compared with patients with WM without dysphagia, while controlling for other covariates in the model

### LIMITATIONS

- This study was subject to the omissions and inaccuracies inherent in claims data. However, all cohorts are likely equally affected; thus, study conclusions should not be impacted
- Multivariable model adjustment may be subject to residual confounding due to unmeasured confounders
- The analyses were conducted in a cohort of commercially insured and Medicare Advantage patients and may not be generalizable to patients with other types of insurance (eg, Medicaid) or uninsured patients

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