

The Feasibility of Measuring BTKi Medication Adherence in the Treatment of CLL/SLL Using an Electronic Patient-Reported Outcomes (ePRO) Platform

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CONCLUSIONS

- The study demonstrated that using the Canopy ePRO-based RTM platform, it is feasible to measure and report real-time remote medication adherence, defined as self-reported missed medication doses, in patients undergoing oral BTKi treatment
- Having access to real-time, real-world patient medication adherence data and the ability to act on this information may improve patient outcomes

INTRODUCTION

- Bruton tyrosine kinase inhibitors (BTKis) have revolutionized the treatment of hematological cancers, including chronic lymphocytic leukemia and small lymphocytic lymphoma (CLL/SLL)^{1,2}
- These therapies, taken orally in the outpatient setting, offer significant convenience and efficacy, but shift the burden of treatment and adherence to the patient³
- A previous claims analysis of patients with CLL/SLL showed that when adherence was measured as the proportion of days covered (PDC) and adherent was defined as PDC ≥80%, only 62.7% of patients were adherent to their oral oncolytic⁴
- The Canopy Remote Therapeutic Monitoring (RTM) platform captures medication adherence, measured as missed medication doses, through electronic patient-reported outcomes (ePROs) and integrates those insights via an electronic health record (EHR) interface
- The platform helps clinicians to quickly understand the patient's experience, prioritize concerning reports, and proactively intervene⁵
- Real-world evidence on the value and usefulness of real-time ePROs for measuring medication adherence is limited

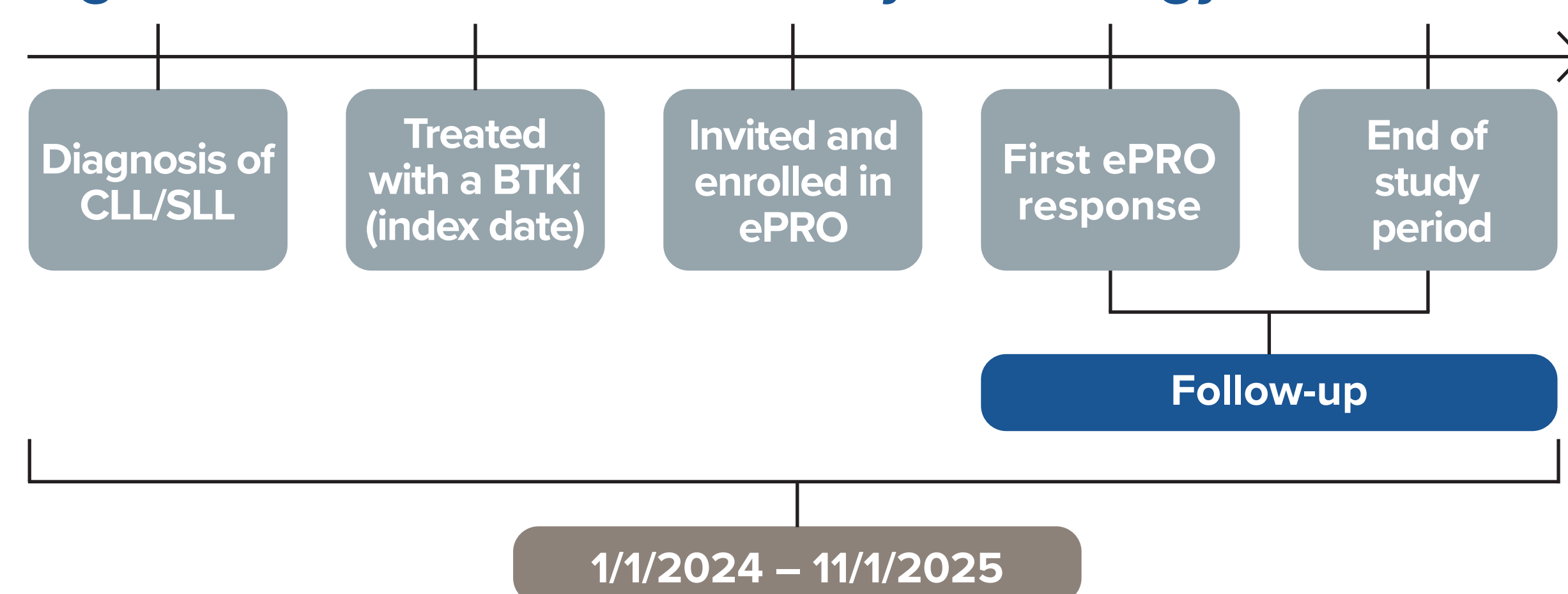
OBJECTIVE

- This study assessed the feasibility of using an ePRO-based platform to measure medication adherence, defined as self-reported missed medication doses, in patients with CLL/SLL treated with a BTKi in a community oncology setting

METHODS

- This was a retrospective study of BTKi treatment-naïve adult patients diagnosed with CLL/SLL and treated with a second-generation BTKi between January 1, 2024, and November 1, 2025 (Figure 1)
- Eligible patients were identified using EHR data and invited to participate in the ePRO program
- ePRO monitoring began at enrollment and data were collected following weekly reminders
- Patients were included in the analysis if they submitted at least one ePRO report during BTKi treatment
- Patients were asked weekly whether they had missed any medication doses "since the last report"
- ePRO responses of interest included self-reported missed BTKi doses and reasons for the missed medication

Figure 1. Cohort Identification by AI Strategy



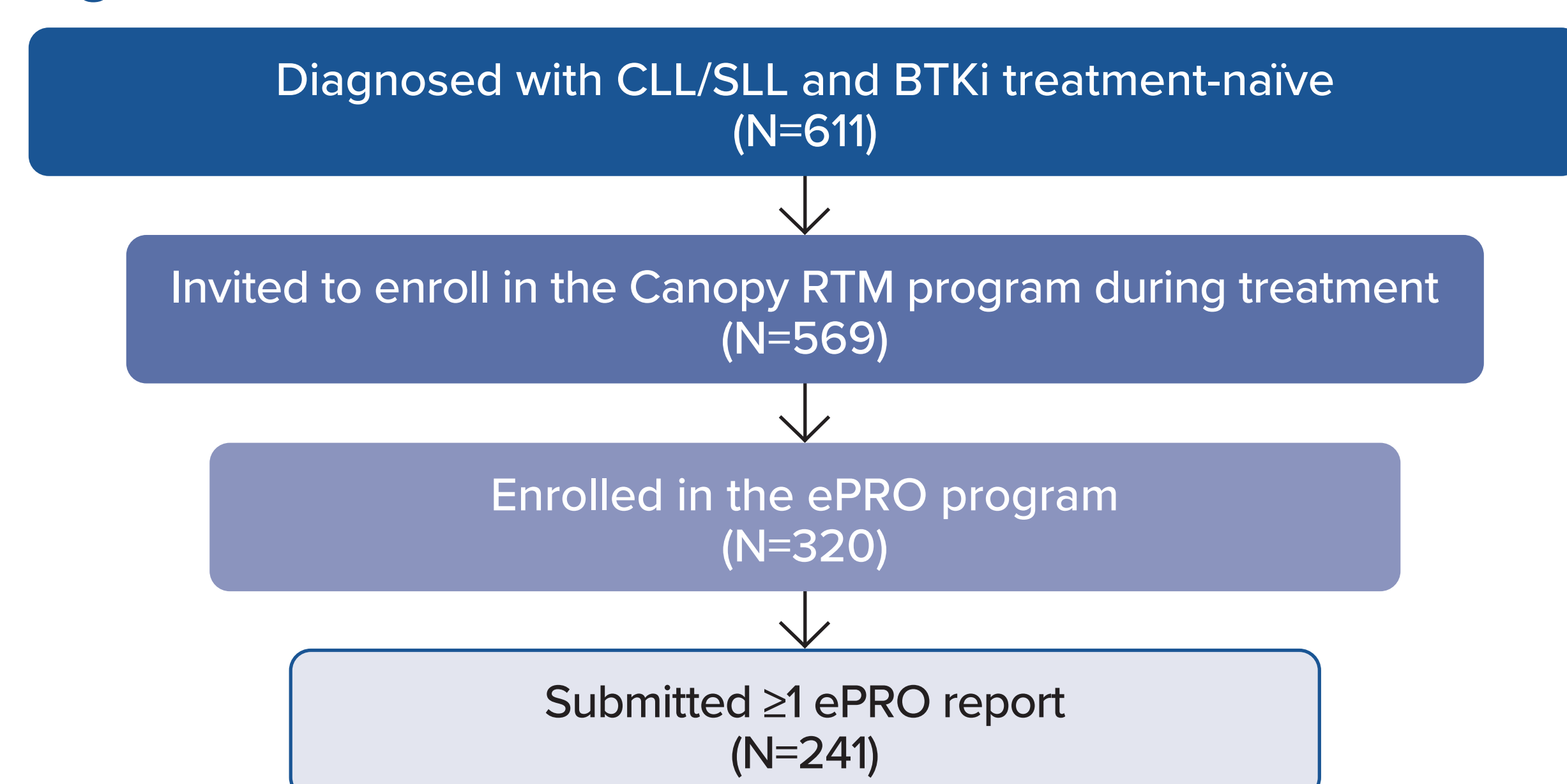
AI, artificial intelligence; BTKi, Bruton tyrosine kinase inhibitor; CLL/SLL, chronic lymphocytic leukemia and small lymphocytic lymphoma; ePRO, electronic patient-reported outcome.

RESULTS

Demographic and Clinical Characteristics

- Of the 320 eligible patients enrolled in the ePRO program, 241 (75.3%) submitted at least one ePRO report and were included in the analysis (Figure 2)
- The median age of these patients was 72 years; 64.7% were male, and among those with known race/ethnicity, 81.0% (85/105) identified as White (Table 1)

Figure 2. Attrition



BTKi, Bruton tyrosine kinase inhibitor; CLL/SLL, chronic lymphocytic leukemia and small lymphocytic lymphoma; ePRO, electronic patient-reported outcome; RTM, remote therapeutic monitoring.

Table 1. Demographic Characteristics

Characteristic	Overall (N=241)
Age at Index (Median, IQR)	72 (64, 79)
Sex, n (%)	
Male	156 (64.7%)
Female	85 (35.3%)
Race/Ethnicity, n (%)	
White	85 (35.3%)
Black	9 (3.7%)
Hispanic/Latino	4 (1.7%)
Other	7 (2.9%)
Unknown/Missing	136 (56.4%)
Charlson Comorbidity Index, n (%)	
0	10 (4.1%)
1	25 (10.4%)
2	56 (23.2%)
≥3	150 (62.2%)
Treatment Characteristics, (Months, IQR)	
Median time from CLL/SLL Diagnosis to Treatment	21.2 (2.2, 48.9)
Number of Previous Cancer Treatments, n (%)	
0	194 (80.5%)
1	18 (7.5%)
≥2	29 (12.0%)

CLL/SLL, chronic lymphocytic leukemia and small lymphocytic lymphoma; IQR, interquartile range.

ePRO Enrollment and Reporting

- Median time from CLL/SLL diagnosis to BTKi treatment initiation was 21 months. For 80.5% of patients, the BTKi was first-line treatment (Table 1)
- Median time from BTKi treatment initiation to ePRO enrollment was 3.0 months
- Over a median of 65.0 days of enrollment following BTKi treatment initiation, 1,749 ePRO reports were submitted (Table 2)
- The mean number of ePRO reports submitted per patient was 13.4. The mean time between reports, for patients who submitted more than one report, was 10.5 days

Table 2. ePRO Enrollment and Reporting

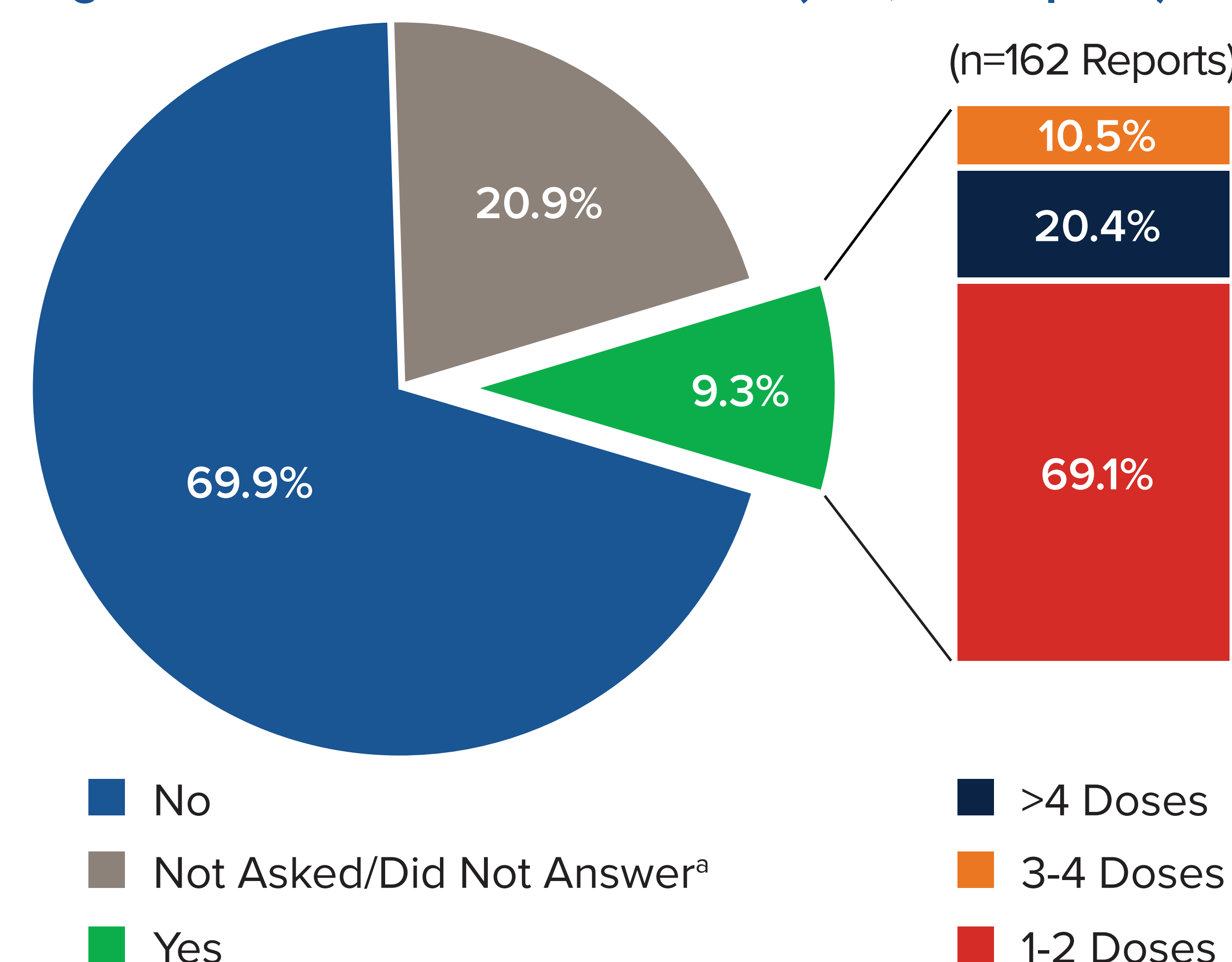
Characteristic	Overall (N=241)
Months (Md) from BTKi Treatment Initiation to Enrollment (IQR)	3 (1, 13)
Days Enrolled During Treatment (IQR)	65 (28, 121)
ePRO Reports Submitted	1,749
Mean ePRO Reports per Patient (SD)	13.4 (18.9)
Mean Days Between Reports (SD)	10.5 (9.3)
Median Days Between Reports (IQR)	7.0 (7, 8)

BTKi, Bruton tyrosine kinase inhibitor; ePRO, electronic patient-reported outcome; IQR, interquartile range; Md, median; SD, standard deviation.

Missed Medication Doses

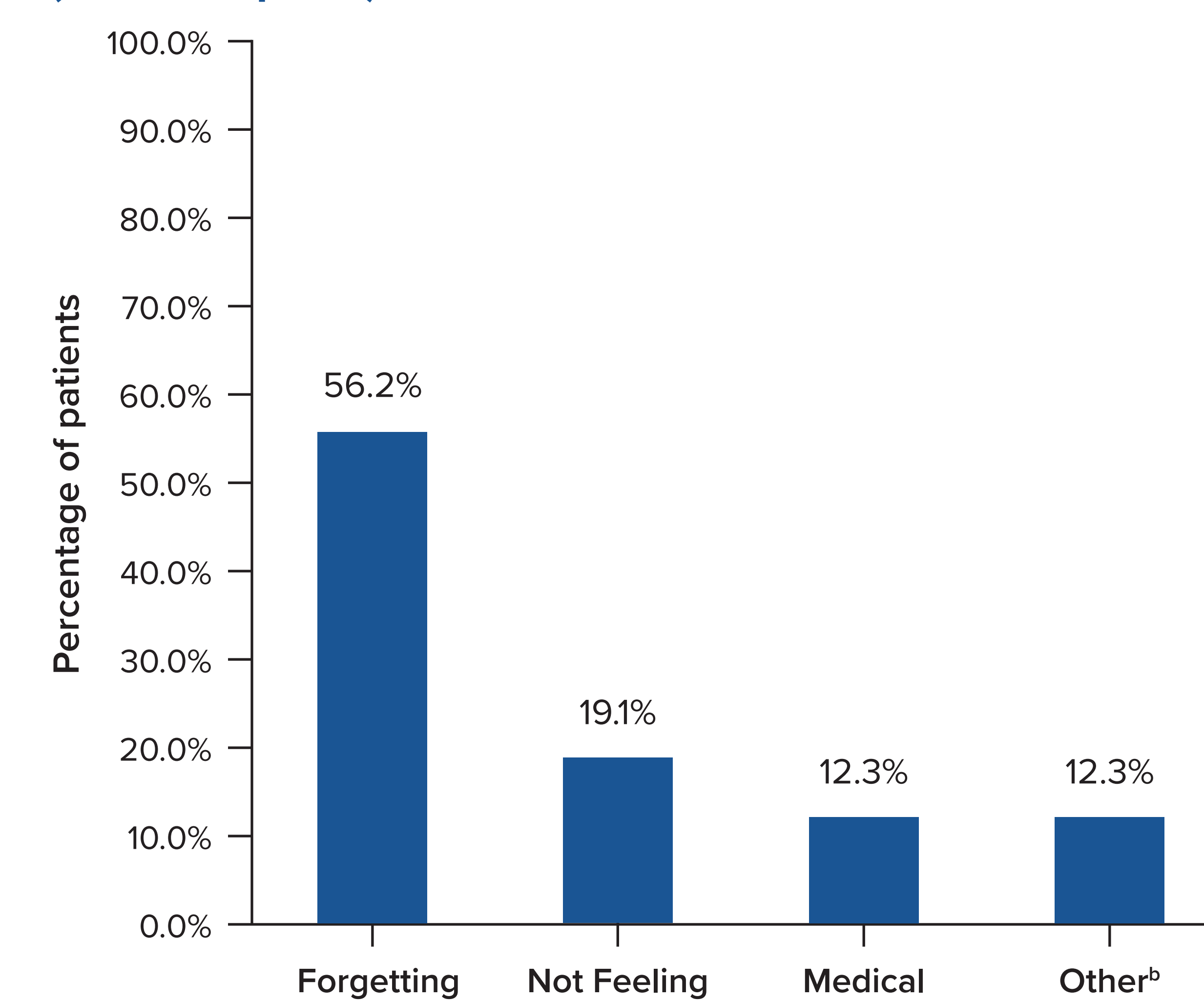
- Of the 241 patients enrolled in the ePRO program, 87 (36.1%) reported having ever missed a BTKi dose
- Of the 1,749 ePRO reports submitted, 162 (9.3%) reports showed that a BTKi medication dose had been missed. Among these, 69.1% of reports showed 1-2 missed doses, 10.5% of reports showed 3-4 missed doses, and 20.4% of reports showed >4 missed doses "since the last report" (Figure 3)
- Among reports of missed doses, reasons for missed doses included forgetting (n=91, 56.2%), not feeling well (n=31, 19.1%), or medical advice (n=20, 12.3%) (Figure 4)

Figure 3. Missed Medication Doses (N=1,749 Reports)



*To ensure adherence data reflect active therapy, missed-dose questions are only asked when a patient confirms the medication is current for them so as to reflect active therapy rather than timing differences between EHR-based enrollment and real-world medication use. EHR, electronic health record.

Figure 4. Reason for Missed Medication Dose (n=162 Reports)^a



^aPatients may have provided more than one reason for missed medication dose. ^bOther included running out of medication, not refilling in time, financial difficulties or reason not reported.

DISCUSSION

- The results demonstrated that patients used ePRO to report missed medication doses while undergoing BTKi treatment for CLL/SLL
- In addition, some patients reported missing multiple doses of medication
- Most patients simply forgot to take their medication but nearly 20% missed medication doses because they were not feeling well, both of which are potentially actionable events when monitored in real-time

LIMITATIONS

- The study was descriptive in nature, relied on EHR data to identify eligible patients, and no statistical analyses were undertaken
- The data reported here were limited to patients who submitted at least one ePRO response and may not generalize to patients who did not participate
- Enrollment and ePRO participation occurred at different time intervals during treatment and thus may affect the length of follow-up

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DISCLOSURES

MA: Funding for current work from BeOne Medicines and Canopy Care; consulting fees from Canopy Care and Plinth Analytics; support for attending meetings and/or travel from Canopy Care and Flatiron Health; stock or stock options in Roche Group and Canopy Care. **RC and LD:** Employment and equity holders in BeOne Medicines. **RK:** Support for current work from Snell Medical Communication (contract employee); stock or stock options in Bristol Myers Squibb. **JE:** Speakers' bureaus for BMS, Gilead, and Genmab; consulting fees from Wugen; participation on a Data Safety Monitoring Board or Advisory Board for Caribou; stock or stock options in Canopy Care.

ACKNOWLEDGMENTS

This study was funded by BeOne Medicines, Ltd.