# Evaluation of Blinatumomab Use and Tolerability in Home and Alternate Infusion Site Patients

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## Background

Acute Lymphoblastic Leukemia (ALL) is a malignant proliferation of lymphoid cells blocked at an early stage of differentiation in the bone marrow, blood, and extramedullary sites. ALL occurs in both children and adults, with a peak incidence at 1-4 years. CD19 antigen is expressed in around 90% of individuals with B-cell ALL and is rapidly internalized upon binding with an antibody making it a suitable therapeutic target.[1]

Blood stem cells mature into either myeloid or lymphoid lineages. Lymphoid stem cells give rise to lymphoblasts, which further differentiate into B-lymphocytes, T-lymphocytes or natural killer cells.[2] Immature B-cells undergo five stages of development (A, B, C, D and E). In stage B, Pro B-cells are formed and express CD19 and other antigens. The T-cell (TCR) receptor is composed of two variable antigen-binding chains associated with invariant accessory proteins (CD3γε, CD3δε, and CD247ζζ chains) that are required for initiating signaling when binding to an antigen.[3]

Blinatumomab is a monoclonal antibody that utilizes Bispecific T-cell Engager (BiTE) technology to bridge endogenous cytotoxic T-cells through CD3 antigen to CD19-positive B-cell precursor ALL cells. This leads to activation of the cytotoxic potential of T-cells to fight cancer cells. Blinatumomab is indicated for patients one month and older with CD19 positive, Philadelphia chromosome-negative B-cell precursor ALL in the consolidation phase of multiphase chemotherapy. Blinatumomab is prepared in one of five different bag formulations for continuous administration. Bags infused over 24 or 48 hours contain larger volumes and lower concentrations in comparison to bags infused over 72 hours, 96 hours or 7 days, which also require preservatives to maintain drug integrity. Infusion duration is determined based on patient's weight and desired frequency of bag changes .[4]

## Purpose

The primary purpose of this study was to evaluate the use of various blinatumomab preparations in home and alternate infusion site (AIS) patients. The secondary objective was to examine the tolerability of blinatumomab infusions at different frequencies.

## Methods

This was an observational, multicenter study examining patients 18-years and older during a five-year period who were infused with blinatumomab. Data collected included indications for use, cycle of treatment, patient weight/BSA, dose/frequency of infusions, and tolerability. Data was obtained through review of electronic medical records.

## Results

723 patients ≥18 years old received blinatumomab between January 2020 – August 2025 *(Figure 1)*. Infusion duration varied both between patients and across different treatment sessions for the same patients. Overall, 24-hour, 48-hour, 72-hour, 96-hour, and 7-day infusion bags were dispensed 336, 344, 57, 80, and 453 times, respectively *(Figure 2)*.

Across all infusion durations, 6 adverse drug reactions (ADRs) were reported. One ADR occurred in a patient receiving the 48-hour infusion bag where it was reported that the patient had a reaction to the medication. The remaining 5 ADRs occurred in patients receiving the 7-day infusion bag. Among the patients receiving the 7-day bag, 3 experienced neurotoxicity, 1 experienced cytokine release syndrome, and 1 developed a venous thromboembolism that was considered unrelated to the medication. ADRs deemed related to the medication resulted in emergency department evaluation and/or hospital admission. *(Figure 3)*

**Figure 1: Patient Characteristics**

| | | |
|---|---|---|
| Patients ≥ 18 year: | | 723 |
| Gender: | | |
| | Male | 425 (58.8%) |
| | Female | 298 (41.2%) |
| Age Range: | | |
| | 18-27 | 153 (21.2%) |
| | 28-37 | 103 (14.2%) |
| | 38-47 | 92 (12.75) |
| | 48-57 | 122 (16.9%) |
| | 58-67 | 134 (18.5%) |
| | 68-77 | 98 (13.6%) |
| | 78-87 | 20 (2.8%) |
| | 88-97 | 1 (0.1%) |

**Figure 2: Blincyto Dispenses (2020 - 2025)**

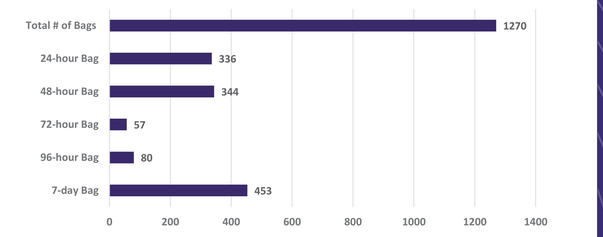
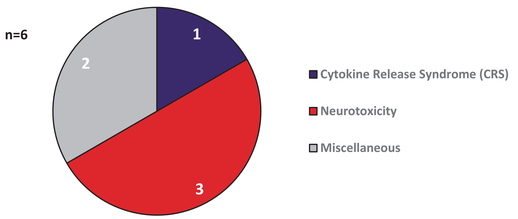



**Figure 3: Adverse Drug Reactions (ADRs)**




## Discussion

This medication-use evaluation demonstrated that varying infusion durations of blinatumomab were generally well-tolerated in the home setting. Among 1,270 total infusions administered, only 6 ADRs were reported. Although the patient population was not stratified based on indication, less than 1% of patients receiving blinatumomab at home or AIS experienced ADRs, whereas in clinical trials, cytokine release syndrome (CRS) was reported in 7-16% of patients with relapsed or refractory ALL, MDR-positive ALL or those who were receiving blinatumomab in the consolidation phase of therapy. Neurologic toxicities were reported in approximately 65% of patients.

While this data may be subject to reporting variability, these findings contribute meaningful insights to home infusion practice. Future research should focus on including pediatric patients as they constitute 35% of patients receiving blinatumomab and should also focus on the 72- and 96- hours infusion as these are being increasingly prescribed as a more convenient option for patients and prescribers. However, given that this evaluation represents a specific patient population and practice environment, caution should be taken when generalizing the findings to broader populations or different care models.

## Conclusions

Results from this study demonstrated that blinatumomab administered via home or AIS was associated with a favorable safety profile across multiple infusion durations. Adverse drug reactions were uncommon, supporting the feasibility of outpatient administration in selected adult patients. While interpretation is limited by potential reporting variability, these findings inform current home infusion practices and identify areas for further study, including pediatric populations and emerging infusion options.

## Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Zein Dib, David Shepherd, Christopher Roy, Andrew Chinn, Michelle Sahlani, Cara Bivona, Maria Giannakos: Nothing to disclose.

## References

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