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# Population Health and Economic Benefits of Pola-R-CHOP versus R-CHOP in Patients with Previously Untreated Diffuse Large B-Cell Lymphoma in the United States

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## Summary

Treatment with Pola-R-CHP resulted in **13,329 incremental life years** (+4%) and **13,121 incremental quality-adjusted life years** (+5%) over a lifetime horizon versus R-CHOP

Pola-R-CHP **prevented 2,335 disease progression events** versus R-CHOP (25% reduction)

The use of Pola-R-CHP resulted in an estimated saving of **$1.75 billion** due to prevention of progression events and death

At the population level, Pola-R-CHP is cost effective versus R-CHOP with a net monetary benefit of **$1.04 billion**

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## Background

- Diffuse large B-cell lymphoma (DLBCL) is the most common non-Hodgkin lymphoma subtype.[1] In the US, the prevalence of DLBCL is expected to increase by 11% between 2020 and 2025.[2]
- Regarding first-line treatment of DLBCL, several studies have demonstrated that polatuzumab vedotin in combination with rituximab, cyclophosphamide, doxorubicin, and prednisone (Pola-R-CHP) is cost effective versus rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) as a result of an improved and sustainable progression-free survival benefit, reducing the use of subsequent therapies such as chimeric antigen receptor T-cell therapy (CAR-T; **Table 1**).[3–5]
- Although the clinical and economic value of Pola-R-CHP has been demonstrated at the patient level, the impact of Pola-R-CHP at a population level is unknown.

**Table 1. Pola-R-CHP is cost effective versus R-CHOP in previously untreated DLBCL[5]**

| Treatment | LYs | QALYs | Total cost, USD | Cost/QALY, USD |
|---|---|---|---|---|
| **Pola-R-CHP** | 12.20 | 10.15 | 251,825 | |
| **R-CHOP** | 11.73 | 9.69 | 219,001 | |
| **Difference** | **0.47** | **0.46** | **32,824** | **70,719** |

DLBCL, diffuse large B-cell lymphoma; LY, life year; Pola-R-CHP, polatuzumab vedotin in combination with rituximab, cyclophosphamide, doxorubicin, and prednisone; QALY, quality-adjusted life year; R-CHOP, rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone.

### Objective:

- To examine the societal value of delaying disease progression in patients with DLBCL after first-line treatment with Pola-R-CHP versus R-CHOP in the US over a lifetime horizon.

## Methods

### Cohort:

- Patients with previously untreated DLBCL in the US were enrolled (static cohort).

### Time horizon:

- Lifetime (60 years).

### Outcomes:

- Cumulative life years (LYs) and quality-adjusted LYs (QALYs) gained were evaluated.
- Cumulative treatment, routine care, adverse reactions, subsequent treatment, work productivity, and end-of-life costs were estimated.
- The cumulative number of disease progression events prevented were estimated.

### Incremental net monetary benefit (NMB) analysis:

- Incremental NMB is calculated as shown in **Figure 1**
  - A positive value of incremental NMB would indicate that Pola-R-CHP is cost effective versus R-CHOP at a population level.

**Figure 1. Incremental NMB method**




NMB, net monetary benefit; WTP, willingness to pay.

### Scenario analysis:

- The impact of an approximately 2-fold increase in CAR-T use on outcomes was examined in both treatment arms, to reflect potential increase in CAR-T use due to its recent approval by the FDA for the second-line treatment of DLBCL[8,9]
  - The analysis assumed increases from the base case in the use of CAR-T from 7.32% to 14.63% and from 9.50% to 18.90% after Pola-R-CHP and R-CHOP, respectively (**Table 2**).

**Table 2. Subsequent treatment after first-line therapy in the POLARIX study**

| Treatment* | Pola-R-CHP (%) | R-CHOP (%) | Total costs, USD | Notes |
|---|---|---|---|---|
| **Salvage therapy + rituximab** | 34.15 | 31.84 | 19,376.52† | Estimated using mean dosing, ASP, and administrative costs |
| **Salvage therapy** | 5.69 | 3.91 | 3,527.12‡ | |
| **Chemotherapy** | 8.13 | 8.38 | 16,552.64§ | |
| **Chemotherapy + rituximab** | 29.27 | 22.35 | 29,250.96¶ | |
| **Pola-BR** | 0 | 4.47 | 112,805.44 | |
| **Rituximab monotherapy** | 1.63 | 2.23 | 31,642.79 | |
| **CAR-T** | 7.32 | 9.50 | 501,994.57 | Keating et al. 2022[6] |
| **SCT** | 13.82 | 17.32 | 351,913.22 | Purdum et al. 2019[7] |

*In a treatment-level analysis of POLARIX, the average number of subsequent treatments was higher with R-CHOP than with Pola-R-CHP (2.28 vs 2.03). †Cost was based on treatment with R-ICE. ‡Cost was based on treatment with ICE. §Cost was based on treatment with bendamustine. ¶Cost was based on treatment with bendamustine + rituximab. ASP, average sales price; BR, bendamustine + rituximab; CAR-T, chimeric antigen receptor T-cell therapy; ICE, ifosfamide, carboplatin, etoposide; R-ICE, rituximab, ifosfamide, carboplatin, etoposide; SCT, stem cell transplantation.

## Results

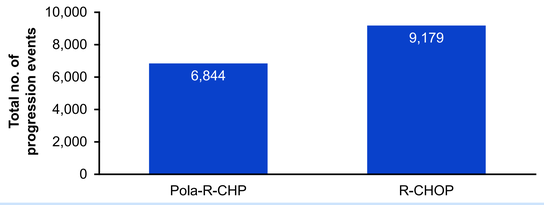
- A total of **28,270 patients** eligible for first-line treatment in 2023 were included, based on the proportion of patients with previously untreated DLBCL receiving Pola-R-CHP or R-CHOP (91.0%) and the annual increase in the incidence of DLBCL (2.2% per year).
- Pola-R-CHP resulted in 13,329 incremental LYs (+4%) and 13,121 incremental QALYs (+5%) versus R-CHOP, over a lifetime horizon (**Table 3**).

**Table 3. LYs and QALYs at the population level**

| Treatment | LYs | QALYs |
|---|---|---|
| **Pola-R-CHP** | 344,799 | 286,906 |
| **R-CHOP** | 331,471 | 273,785 |
| **Difference** | **13,329** | **13,121** |

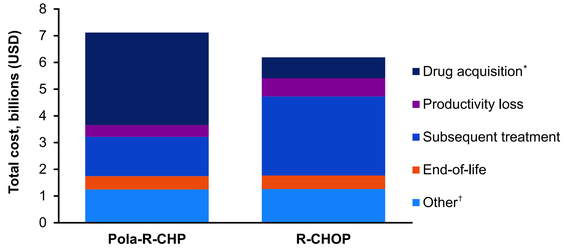
- Pola-R-CHP prevented 2,335 disease progression and death events (25% reduction versus R-CHOP; **Figure 2**).

**Figure 2. Number of disease progression events with Pola-R-CHP and R-CHOP**




- Total savings, excluding drug costs, were $1.75 billion (**Figure 3**).

**Figure 3. Incremental costs at the population level**




| Treatment | Drug acquisition,* USD | Productivity loss, USD | Subsequent treatment, USD | End-of-life, USD | Other,† USD |
|---|---|---|---|---|---|
| **Pola-R-CHP** | 3,463,732,444 | 442,625,716 | 1,467,782,211 | 495,816,263 | 1,249,028,612 |
| **R-CHOP** | 782,890,429 | 680,596,447 | 2,959,431,198 | 506,636,950 | 1,261,496,937 |
| **Difference** | **2,680,842,015** | **−237,970,731** | **−1,491,648,988** | **−10,820,687** | **−12,468,325** |

*Cost of treatment is $122,525 for Pola-R-CHP and $27,694 for R-CHOP.
†Other costs include drug administration, adverse reactions, and routine care costs.

- At the population level, Pola-R-CHP was found to be cost effective versus R-CHOP with an incremental NMB of $1.04 billion (**Figure 4**).

**Figure 4. Incremental NMB with Pola-R-CHP versus R-CHOP**

| Incremental QALYs (monetized assuming a WTP threshold of $150,000) | Incremental costs | Incremental NMB |
|---|---|---|
| **$1,968,211,315*** | **$927,933,284†** | **$1,040,278,031** |

*Calculated by multiplying 13,121 QALYs by $150,000.
†Calculated by subtracting $1,752,908,731 (incremental cost savings) from $2,680,842,015 (incremental drug costs).

### Scenario analysis:

- The incremental cost savings for Pola-R-CHP versus R-CHOP increased from $1.75 billion in the base case to $2.20 billion, resulting in total incremental costs of $477.3 million and an incremental NMB increasing from $1.04 billion to $1.49 billion.

### Limitations:

- This analysis used a static cohort instead of a dynamic cohort, which considers multiple annual patient cohorts entering the analysis in subsequent years.
- The analysis does not take into account the changing landscape in DLBCL and new therapies entering the market.
- The cost-effectiveness analysis is based on assumptions regarding the extrapolation of survival curves and treatment effects over time.

## Conclusion

- This analysis demonstrated that the use of Pola-R-CHP in patients with previously untreated DLBCL generates substantial population-level value in the US by **extending QALYs and reducing the number of disease progression events and deaths, which resulted in an incremental NMB of over $1 billion**.

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### Disclosures

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