Economic Evaluation of Dupilumab Versus Standard of Care for the Treatment of Adult Patients With Moderate-to-Severe **Prurigo Nodularis in the United States**

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Background

Dupilumab 300 mg

every 2 weeks

versus

BSC alone

Prurigo nodularis (PN) has a negative impact on health-related quality of life (HROOL) and emotional well-being¹

- PN is a chronic inflammatory disease characterized by nodular, itchy lesions.¹
- Dupilumab, the first approved biologic therapy for PN, may be given on top of best supportive care (BSC) treatments (e.g., topical corticosteroids and calcineurin inhibitors).^{5,6}



Objective

 To evaluate the cost-effectiveness of dupilumab 300 mg every 2 weeks (Q2W) + BSC versus BSC alone for treating adults with PN, from a **United States (US) private health** insurance payer perspective.

Conclusions

 Compared with BSC alone, dupilumab 300 mg Q2W + BSC is cost-effective for treating adults with PN that is inadequately controlled by BSC, with an ICER of \$102,700/QALY gained.

DUPILUMAB

 Treatment with dupilumab + BSC is associated with higher quality-adjusted life-years (QALYs) relative to BSC, reflecting improvements in **HRQOL** with dupilumab treatment.

Methods and Results

- Outcomes and costs were modeled using a 1-year decision tree followed by a lifetime horizon Markov model (Figure 1).
- Base-case model inputs were as follows:
- Population: Patients with moderate to severe PN
- **Comparators:** Dupilumab + BSC vs. BSC
- **Response definition:** ≥ 4-point improvement from baseline on the Worst-Itch Numerical Rating Scale (WI-NRS) (scale of 0-10: higher scores indicate worse itch)¹
- **Response rates:** 58.8% with dupilumab + BSC, 19.0% with BSC alone from two 24-week randomized controlled trials



- (PRIME, PRIME 2)
- Utilities: Data derived from PRIME and PRIME2¹
- Cost and resource estimates: Derived from published sources, PRIME and PRIME2, and a US database analysis^{1,7-10}
- Analysis: Used US net price of dupilumab (cost year 2023) and calculated QALYs gained, life-years (LYs) gained, and incremental cost-effectiveness ratio (ICER)
- Discounting: Costs and QALYs discounted at 3% annually¹¹
- Time horizon: Lifetime
- Cost-effectiveness was considered at a threshold of \$100,000 to \$150,000 per QALY gained as defined by the Institute for Clinical and Economic Review.¹²
- Robustness of findings was tested using probabilistic and one-way sensitivity analyses. The one-way sensitivity analysis included all model inputs; discount rates were varied between 0% and 6% and all other inputs by $\pm 10\%$.
- In the base-case analysis, dupilumab + BSC was associated with an additional 0.8 QALYs over BSC (13.5 vs. 12.7) and more LYs in response (4.1 vs. 0.4). The deterministic ICERs were \$102,700 per QALY gained and \$21,500 per LY in response (Table 1).
- Results were robust to plausible variations in input parameters in one-way sensitivity analyses (Figure 2). Only 3 inputs produced ICER deviations of more than \$15,000: the population's baseline utility, the discounting factor applied to effects/outcomes, and dupilumab's acquisition price.
- The ICER ranged from \$89,000 per QALY to \$136,700 per QALY in 10,000 iterations of the probabilistic sensitivity analysis (Figure 3).

Table 1. Base-Case Results

	Dupilumab	BSC	Incremental	ICER
QALYs (discounted)	13.5	12.7	0.8	\$102,700/QALY gained
LYs in response (discounted)	4.1	0.4	3.7	\$21,500/LY in response

BSC = best supportive care; ICER = incremental cost-effectiveness ratio; LY = life-year; PN = prurigo nodularis; QALY = quality-adjusted life-year. Note: PN was assumed not to affect mortality; therefore, there is no difference in LY gained between dupilumab and BSC.

BSC = best supportive care; PN = prurigo nodularis; WI-NRS = Worst-Itch Numerical Rating Scale. Note: The response criterion was defined as a \geq 4-point improvement on the WI-NRS (scale of

0-10).1 a Moderate to severe PN was defined as PN inadequately controlled on topical prescription therapies or when those therapies are not appropriate. b The clinical assessment timepoint in the PRIME and PRIME 2 trials was at 24 weeks.

> Figure 2. Tornado Diagram: Top 5 Most Influential Model Inputs -\$30,000 -\$10,000 \$10,000 \$30,000 \$50,000 **Utility - baseline Discount - effects** Acq. cost per pack - dupilumab, injection **Discount - costs** Lower bound **Delta utility Markov** Higher bound

Figure 3. Cost-Effectiveness Plane



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