Pharmacoeconomic Evaluation of Different Gonadotropin-Releasing Hormone Analogs in The Treatment of Premenopausal Hormone Receptor-positive Breast Cancer in China

ISPOR 2026
May 17-20, 2026 | Philadelphia, PA | USA

EE273

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BACKGROUND

- Premenopausal hormone receptor-positive breast cancer (BC) is a common hormone-dependent malignancy among women. In this setting, ovarian function suppression (OFS) with gonadotropin-releasing hormone analogues (GnRHas) represents a key component of standard adjuvant endocrine therapy[1].
- Previous studies suggest that leuprorelin and goserelin are comparable with respect to efficacy, clinical needs and recommendation, and accessibility. However, differences in their pharmacoeconomic profiles were observed when the price of the leuprorelin-3M formulation had not yet been adjusted[2].
- Following the implementation of volume-based procurement (VBP), up-to-date pharmacoeconomic studies and evidence on the use of leuprorelin acetate for premenopausal HR+ breast cancer in China remain limited. To address this gap, HEOR studies from multiple analytical perspectives are needed to generate robust clinical and pharmacoeconomic evidence aligned with current health policies, updated clinical pathways, and the needs of different stakeholders.

OBJECTIVE

- To evaluate the economics of three GnRHa drugs, leuprorelin 11.25 mg 3-month (3M) depot, leuprorelin 3.75 mg 1-month (1M) depot and goserelin 3.6 mg 1-month (1M) for the treatment of premenopausal patients with hormone receptor-positive BC in China.

Method: Model Design

Model Features	
Model design	Cost-minimization analysis model
Model perspectives	Societal, healthcare provider, patient, and payer perspectives
Target Patients	Premenopausal hormone receptor-positive BC
Model comparators	Leuprorelin-3M vs. leuprorelin-1M vs. goserelin-1M
Time horizon	5 years
Model cycle length	1- month or 3- month
Annual discount rate	4.5% for the direct medical, direct non-medical and indirect costs
Model Inputs	• **Direct Medical Costs:** Drug cost, treatment and examination fees, storage cost, administrative cost • **Direct Non-Medical Costs:** Transportation and accommodation • **Indirect Costs:** Productivity loss
Reimbursement rate	• 70%~80% for direct medical costs • 0% for Direct non-medical costs and indirect costs
Model outcomes of interest	• Total costs • Differences of detailed costs

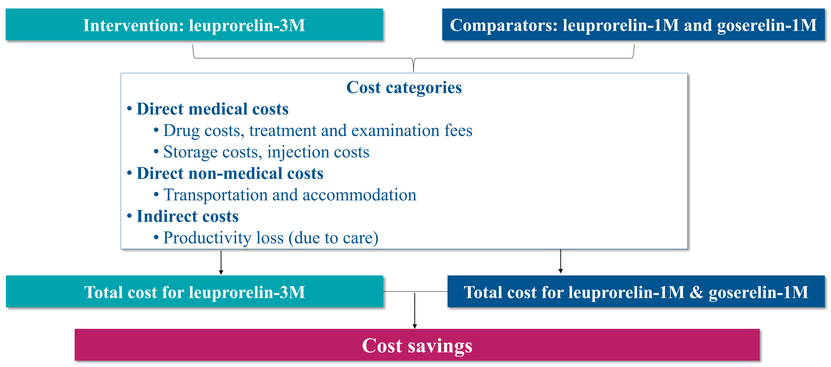


Figure 1: Diagram of Model Structure

Method: Model Inputs

- Data used in this model were from the published literature and public data sources.
- For the adherence data, it is assumed that the annual visit frequency of treatment-discontinued patients is 50% of that of fully adherent patients[3].

2.1 Key Cost Inputs

Key Parameters	Leuprorelin-3M	Leuprorelin-1M	Goserelin-1M	Reimbursement rate
Direct Medical Costs				
Drug Unit Prices				
Leuprorelin & Goserelin	$296.99	$127.95	$151.96	70.00%
Tamoxifen Citrate Tablets	$9.10	$9.10	$9.10	80.00%
Letrozole	$4.37	$4.37	$4.37	70.00%
Medical Service Item Unit Prices[#]				
Registration Fee	$5.32	$5.32	$5.32	80.00%
Injection (including syringe cost)	$1.01	$1.96	$2.02	80.00%
Examination & Test Item Unit Prices[#]				
Unit Price of Breast Cancer Examination Items	$458.49	$458.49	$458.49	70-80%
Direct Non-Medical Costs				
Transportation Costs[3]				
Average Transportation Cost Per Visit for Local Patients				$9.68
Average Transportation Cost Per Visit for Non-Local Patients				$34.22
Accommodation & Meal Costs[3]				
Average Daily Meal Cost Per Person				$11.37
2-Day Accommodation & Meal Cost for Non-Local Patients Requiring Accommodation				$56.92
Indirect Costs				
Productivity Loss[3-5]				
Work Absence Time per Treatment for Local Patients (Hours)				8.00
Work Absence Time per Treatment for Non-Local Patients Without Accommodation (Hours)				8.00
Work Absence Time per Treatment for Non-Local Patients Requiring Accommodation (Hours)				16.00
Proportion of Non-Local Patients Requiring Overnight Accommodation				49.50%
Proportion of Patients Accompanied by Family Members per Visit				48.90%
Hourly Wage				$6.74
Employment Rate of Breast Cancer Patients				45.24%
Employment Rate of the General Population				68.60%
Discount Rate				4.50%

[*]All included medical costs were adjusted to 2025 Chinese currency values according to the historic inflation rate of China, which are reported in 2025 US dollars using the exchange rate as of December (¥7.05 for $1). [#]Based on medical service price schedules of six provinces/municipalities in China.

2.2 Adherence Inputs[3]

Drug	Indicator	Year 1	Year 2	Year 3	Year 4	Year 5	Annual Visit Frequency
Leuprorelin-3M	Persistence Rate	91.00%	85.00%	82.00%	78.00%	70.00%	4
	Discontinuation Rate	9.00%	6.00%	3.00%	4.00%	8.00%	2
Leuprorelin-1M	Persistence Rate	91.00%	85.00%	82.00%	78.00%	70.00%	12
	Discontinuation Rate	9.00%	6.00%	3.00%	4.00%	8.00%	6
Goserelin-1M	Persistence Rate	91.00%	85.00%	82.00%	78.00%	70.00%	12
	Discontinuation Rate	9.00%	6.00%	3.00%	4.00%	8.00%	6

2.3 Product Cost per Unit[6-7]

	Leuprorelin-1M (Branded Drug)	Leuprorelin-1M (Generic Drug)	Goserelin-1M
Storage Conditions	Store at room temperature; no refrigeration required	Refrigeration required	Refrigeration required
Cold Storage Cost	-	$0.02 (￥0.17)	$0.08 (￥0.58)
Administration Time (minutes)	0.81	1.24	1.24
Administration Cost	$0.23(￥1.62)	$0.35 (￥2.48)	$0.35 (￥2.48)
Additional Syringe Cost	-	$0.04 (￥0.30)	$0.04 (￥0.30)
Scratch Treatment Cost	-	$0.76 (￥5.38)	$0.76 (￥5.38)
Total Cost	$0.23(￥1.62)	$1.18 (￥8.33)	$1.24 (￥8.74)

Assuming that a hospital uses 20,000 vials of 1M GnRHa formulations annually, Leuprorelin-1M (branded drug) could save $19,047 (￥134,279) versus Leuprorelin-1M (generic drug) and $20,205 (￥142,442) versus Goserelin-1M (generic drug), while reducing total administration time by 143.33 hours.

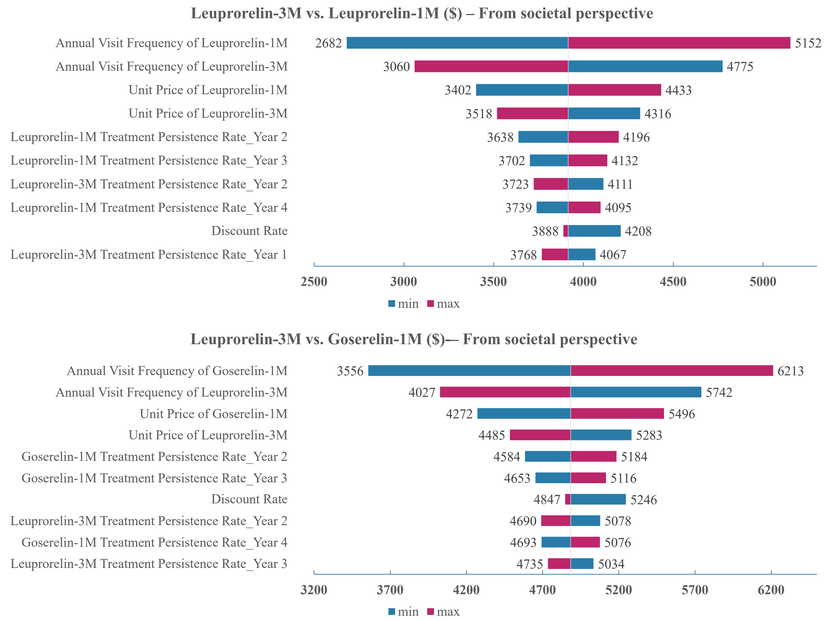
For GnRHa drugs with the same 3-month formulation, direct non-medical costs and indirect costs are expected to be comparable; therefore, the economic comparison can be based primarily on drug price.

Result 1: Base-Case Analysis

Societal Perspective – 5 Years Total	Leuprorelin-3M	Leuprorelin-1M	Goserelin-1M
Direct Medical Costs	**$7,625.73**	**$9,000.51**	**$9,969.80**
Drug Costs	$4,435.51	$5,601.95	$6,568.91
Treatment and Examination Fees	$3,190.22	$3,398.56	$3,400.89
Direct Non-Medical Costs	**$571.09**	**$1,713.28**	**$1,713.28**
Transportation Costs	$280.31	$840.92	$840.92
Accommodation & Meal Costs	$290.79	$872.36	$872.36
Indirect Costs	**$698.94**	**$2,096.83**	**$2,096.83**
Patient Labor Productivity Loss	$401.31	$1,203.94	$1,203.94
Caregiver Labor Productivity Loss	$297.63	$892.89	$892.89
Total Cost	**$8,895.77**	**$12,810.62**	**$13,779.91**

Over the 5-year study period, treatment with leuprorelin-3M resulted in total cost savings of $3,915 (vs. leuprorelin-1M) and $4,884 (vs. goserelin-1M) from the societal perspective, $1,375 (vs.leuprorelin-1M) and $2,344 (vs. goserelin-1M) from the healthcare provider's perspective, $2,932 (vs. leuprorelin-1M) and $3,222 (vs.goserelin-1M) from the patient perspective, and $983 (vs. leuprorelin-1M) and $1,662 (vs. goserelin-1M) from the payer perspective. With a 1-year time horizon, Leuprorelin-3M remained economically favorable versus leuprorelin-1M and goserelin-1M across different perspectives.

Result 2: One-Way Sensitivity Analysis



One-way sensitivity analysis showed that the most influential parameters were the annual number of injections for leuprorelin-1M, goserelin-1M and leuprorelin-3M, but the uncertainty has limited impact on results.

CONCLUSIONS

- Leuprorelin-3M demonstrates economic advantages over leuprorelin-1M and goserelin-1M by reducing the number of injections and lowering costs, benefiting multiple stakeholders including healthcare providers, patients and payers.
- Sensitivity analyses suggested that model uncertainty had a limited effect on the results, further supporting Leuprorelin-3M as a favorable treatment option.

REFERENCES

1. FRANCIS PA, REGAN MM, FLEMING GF, et al. SOFT Investigators; International Breast Cancer Study Group. Adjuvant Ovarian Suppression in Premenopausal Breast Cancer. *N Engl J Med*. 2015, 372(5):436-46;
2. HAO H, et al. A comprehensive drug evaluation of GnRHa-related drugs in breast cancer patients. *Cent South Pharm*, 2024,22(9): 2460-2465;
3. FAN L, CHEN YC, DU F, et al. Analysis on Minimum Cost of Adjuvant Endocrine Therapy in Premenopausal Hormone Receptor positive Breast Cancer in China. *Chin J Pharm Econ*. 2020, 15(4): 5-10;
4. National Bureau of Statistics of China. China Statistical Yearbook 2024 [EB/OL]. [EB/OL].[20250905].https://www.stats.gov.cn/zwfwck/sjfb/202502/t20250228_1958817.html;
5. WU J, LIU G, et al. China guidelines for pharmacoeconomic evaluations (2025 Chinese –English version). *Chin Mark Pres*, 2025;
6. LIU F, DENG Z. Comparison of bacterial contamination status of drug injection and nurses' work efficiency by using different ampoule products. *Chongqing Yixue*. 2017, 46(29): 4075-4080;
7. ZHANG Y, LI Y, SHI J, et al. Comparison of the influence of two different ampoule materials on nursing work. *Nurs J Chin PLA*. 2013,30(21): 73-74;

DISCLOSURE AND ACKNOWLEDGEMENTS

The poster is intended for healthcare professionals only.

- The research was funded by Takeda (China) International Trading Co., Ltd.
- Gao YB is an employee of Takeda (China) International Trading Co., Ltd. The other authors declare no competing interest.
- Medical writing support for the development of this poster, under the direction of the authors, was provided by Wilson Wang, an employee of Shanghai ExtroPharm Co., Ltd, funded by Takeda (China) International Trading Co., Ltd, and complied with the Good Publication Practice 2022.