Cost-Effectiveness of Vonoprazan Versus Proton-Pump Inhibitors in Adults with Erosive Esophagitis in the United States: A Markov Model of Lifetime Outcomes

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INTRODUCTION

- Erosive esophagitis (EE) is a chronic condition associated with complications including Barrett's esophagus (BE) and esophageal adenocarcinoma (EAC)
- Vonoprazan is indicated for healing and maintenance of EE
- We evaluated the lifetime cost-effectiveness of vonoprazan vs. proton-pump inhibitors (PPIs) in adults in the United States (US) diagnosed with EE

METHODS

- A Markov model projected lifetime clinical and economic outcomes for commercially insured US adults with EE (mean age 51.3 years); cycle length was 4 weeks
- Clinical outcomes were generated from treatment-specific probabilities of healing and maintenance of healing calibrated to rates of EE-related complications such as BE, EAC, and death
- Drug costs were assessed using wholesale acquisition cost (WAC) and estimated net price (52% discount); vonoprazan was assumed to have price parity with PPIs starting year 8
- Cost-effectiveness was evaluated at a $100,000/QALY threshold; costs and outcomes were discounted 3% annually

DISCUSSION/SUMMARY

- Vonoprazan was projected to be cost-effective for Los Angeles (LA) Grades A-D EE at WAC price and cost-saving at net price over a lifetime horizon
- Higher drug costs were offset by improved clinical outcomes and lower downstream costs
- Better healing with vonoprazan than PPIs was the principal driver of these findings
- Results were robust in probabilistic sensitivity analyses

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Vonoprazan treatment of EE was cost-effective at WAC price and cost-saving at net price in both all EE and LA grades C-D. Better healing rates and fewer complications compared with PPIs offset the increased drug costs, driving these outcomes.

Cost-effectiveness of vonoprazan vs. PPI in adults with commercial insurance diagnosed with EE at an average age of 51.3 years, all EE population (N=16,207,803) and severe EE population (N=4,214,436)

Table. Clinical and Economic Outcomes (2025 USD)

	All EE (LA Grades A-D)			Severe EE (LA Grades C/D)		
Outcomes	**PPI**	**Vonoprazan**	**Difference**	**PPI**	**Vonoprazan**	**Difference**
ICER per QALY						
WAC	---	---	$28,402	---	---	$18,878
Net	---	---	Dominant	---	---	Dominant
Economic Outcomes, per-person						
Drug						
Using WAC	$1,547	$18,527	$16,979	$1,457	$17,812	$16,355
Using net price†	$743	$8,893	$8,150	$699	$8,550	$7,850
Monitoring and follow-up	$75,526	$66,889	-$8,636	$85,749	$76,681	-$9,068
Complications§	$21,743	$19,546	-$2,197	$23,296	$21,459	-$1,837
EAC	$11,914	$10,509	-$1,405	$18,266	$16,329	-$1,937
Procedures	$4,218	$5,245	$1,027	$3,709	$4,419	$711
Total						
Using WAC	$114,949	$120,717	$5,768	$132,476	$136,700	$4,224
Using net price†	$114,144	$111,083	-$3,061	$131,718	$127,438	-$4,280
Clinical Outcomes, overall						
Complications§	48,459,565	44,138,028	-4,321,537	13,907,681	13,041,568	-866,113
EAC	444,420	398,265	-46,155	165,516	152,432	-13,084
Procedures	3,487,530	3,768,356	280,826	1,023,333	1,032,092	8,759
Esophageal bleed/stricture deaths	2,139	1,947	-193	587	549	-38
EAC deaths	394,942	353,927	-41,015	147,087	135,461	-11,627
QALYs (discounted)	256,443,030	259,734,605	3,291,575	62,821,439	63,764,508	943,068

Figure 1. Cost-Effectiveness Acceptability Curve (CEAC)

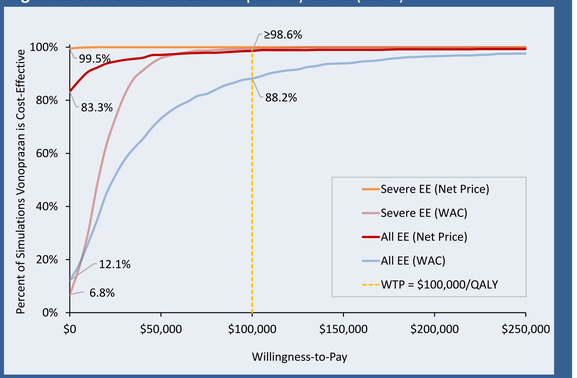
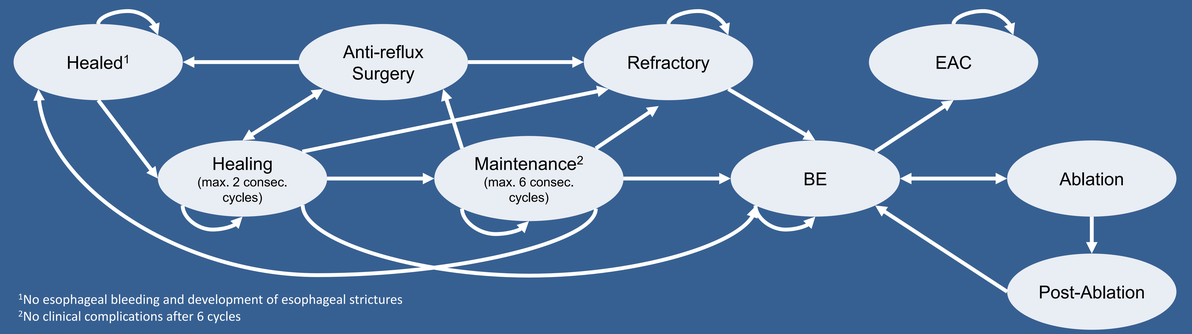


Figure 2. Simplified Model Diagram



[1]No esophageal bleeding and development of esophageal strictures
[2]No clinical complications after 6 cycles

Abbreviations: BE, Barrett's esophagus; CFR: case fatality rate; EAC, esophageal adenocarcinoma; EE, erosive esophagitis; ICER, incremental cost-effectiveness ratio; LA A-D, Los Angeles grades A-D; PPI, proton-pump inhibitor; QALY, quality-adjusted life-year; RR: relative risk; WAC, wholesale acquisition cos; WTP, willingness-to-pay threshold. **Notes:** †Net price equals 52% discount of WAC. § Complications include esophageal bleeding and strictures, and BE.

Model Inputs Table

Parameter	Base Case Value	
	Per Cycle	
Healing Probabilities[1]*	All EE	Severe EE
Healed - healing phase (vonoprazan; cycle 1)	0.815	0.756
Healed - healing phase (vonoprazan; cycle 2)	0.832	0.780
Refractory - maintenance phase (vonoprazan)	0.021	0.033
Healed - healing phase (PPI; cycle 1)	0.748	0.577
Healed - healing phase (PPI; cycle 2)	0.652	0.507
Refractory - maintenance phase (PPI)	0.036	0.053
Clinical Event and Mortality Rates	**Per Cycle**	
Esophageal bleeding rate[2]	0.66%	
Esophageal bleeding CFR[3]	0.0043%	
Esophageal stricture rate[4]	1.4%	
Esophageal stricture CFR[5]	0.0112%	
Patients who develop BE, in all EE[6]	0.22%	
Patients who develop BE, in severe EE[6]	0.34%	
Patients with BE who develop EAC	0.36%	
RR of death from EAC – incident EAC/on-treatment[7†]	8.98	
RR of death from EAC – after treatment failure[7†]	8.98	
RR of death from EAC – in remission[†]	1.00	
Procedure and Success rates	**Per Cycle**	
Anti-reflux surgery rate[8]	0.30%	
Anti-reflux surgery success rate[9]	68.5%	
Anti-reflux surgery failure rate[9]	5.5%	
EE treatment rate after anti-reflux surgery[10‡]	26.0%	
Ablation rate, in BE[11]	0.16%	
Ablation success rate, in BE[12]	35.4%	
Utilities	**Per Cycle**	
Health state utilities	All EE	Severe EE
Healed state[13]	0.940	0.940
Unhealed state[13,14]	0.780	0.690
BE[15]	0.910	0.910
EAC[15-17]	0.524	0.524
QALY Decrements	**Per Cycle**	
Due to surgery[18]	0.25	
Due to ablation[19]	0.10	
Due to esophageal bleeding or stricture[20]	0.18	
Cost of Drugs, WAC[21]	**Per Cycle**	
Healing phase	Healing	Maintenance
Vonoprazan (model years 1-7, only)	$637	$637
Weighted basket of PPIs§	$51	$34
Cost of Interventions, Commercial¶		
Procedures[22]	**Per Procedure**	
Anti-reflux surgery	$41,889	
Ablation for BE	$7,845	
Complications[22]	**Per Procedure**	
Treatment of esophageal bleeding	$15,780	
Treatment of esophageal strictures	$6,482	
EAC[23]	**Per Patient**	
Treatment of EAC	$235,868	

* Healing phase comprises 8 weeks of EE healing treatment over 2 cycles; maintenance phase comprises up to 24 weeks of maintenance treatment over a maximum of 6 cycles. † RR dead with EAC versus general population. ‡ Vonoprazan or PPI. § Cost of PPI estimated for a "basket of drugs" weighted by their respective market shares including dexlansoprazole, esomeprazole, lansoprazole, omeprazole, pantoprazole and rabeprazole. ¶ CMS Medicare rates were converted to commercial rates using multipliers based on Blavin et al. JAMA Health Forum, 6, 2025, and Wang et al. JAMA Network Open, 7, 2024.

Healthcare Encounter Frequencies and Costs, by Health State

		Frequency per 4 Week Cycle[1]					
		EE Only				EE+BE	
Encounter Type	**Cost per Encounter[22]**	**Healing**	**Maintenance**	**Healed**	**Refractory**	**Maintenance**	**Refractory**
Outpatient Visit	$552.53	0.31	0.15	0.15	0.31	0.15	0.15
EGD, biopsy	$1,888.26	0.00	0.00	0.00	0.08	0.00	0.00
EGD, no biopsy	$2,256.27	0.31	0.00	0.00	0.00	0.08	0.15
24 hour pH	$1,800.51	0.15	0.00	0.00	0.00	0.00	0.15
Cost per Cycle		$1,141.25	$85.01	$85.01	$315.26	$258.56	$709.12

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