EE152

Cost-Effectiveness Analysis of Infliximab versus Cyclosporine in Steroid-Refractory Acute Severe Ulcerative Colitis

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Background

- Acute severe ulcerative colitis (ASUC) affects 25% of all ulcerative colitis (UC) patients, requiring hospitalization and treatment with intravenous steroids[1]
- In ASUC cases that are steroid-refractory, infliximab (INFLX) or cyclosporine (CsA) are indicated to induce remission, with the goal of therapy being avoidance of colectomy[2]
- There are no recent cost-effectiveness analyses comparing these two agents from a United States payer perspective utilizing data from multiple clinical trials[3]

Objective

- Estimate the cost-effectiveness of infliximab compared with cyclosporine for steroid-refractory ASUC in U.S. adults from a commercial payer perspective

Methods

- A decision tree was constructed (Figure 1; Table 1).
- Probability, cost, and utility inputs were derived from publicly available literature and resources (Table 2). Cost and utility were discounted at a 3% annual rate.
    - The main outcome measure was incremental cost per quality-adjusted life year (QALY) gained
    - For each annual time step, patients could remain in remission or undergo colectomy, with possible complications and death associated with colectomy
- Uncertainty was assessed through a one-way deterministic sensitivity analysis and scenario analysis.
    - Scenario 1: One year timeframe
    - Scenario 2: Two year timeframe
    - Scenario 3: Use of an infliximab biosimilar (infliximab-dybb)

TABLE 1: Summary of Key Model Characteristics

Population	Adults hospitalized with steroid-refractory ASUC
Comparators	Infliximab vs. cyclosporine
Perspective	U.S. commercial payer
Time Horizon	3 years

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Methods (Cont.)

FIGURE 1: Decision Tree Model

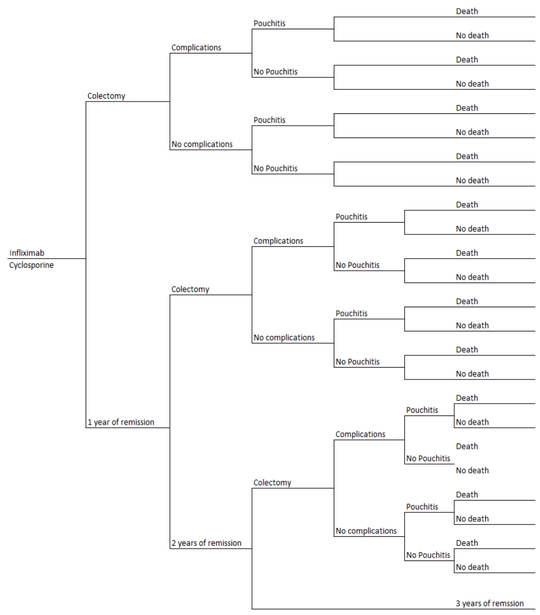


TABLE 2: Summary of Key Model Inputs

Probabilities	
Infliximab 3 year colectomy-free survival[4]	0.955
Cyclosporine 3 year colectomy-free survival[4]	0.939
UC colectomy complication (early/chronic pouchitis)[5]	0.213 / 0.155
UC colectomy death (emergent/elective)[6]	0.115 / 0.004
Mean Annual Costs (2023 US$)	
Infliximab total drug cost (base/biosimilar) [7, 8]	$4,194 / $2,044
Cyclosporine total drug cost[7,8,9]	$1,557
Colectomy[10]	$41,400[10]
Management of early complications[5]	$1,2056
Management of chronic pouchitis[11]	$21,873
Management in clinical remission and post colectomy[12]	$5,153
Utilities	
1 year of remission[13]	0.81
1 year of post-colectomy[14]	0.79
1 year of post-colectomy with early complications[15]	0.49
1 year of post-colectomy with pouchitis[15]	0.40

Results

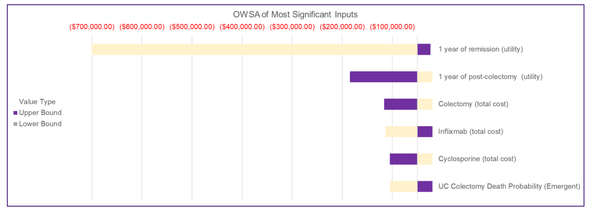
TABLE 3: Base Case Results

	INFLX	CsA	Incremental Value
Cost	$33,756	$36,754	-$2,989
Utility (QALY)	2.086	2.033	0.052
ICER ($/QALY)	**CsA is dominated**		

TABLE 4: Scenario Analysis Results

		INFLX	CsA	Incremental Value
Scenario 1	**Cost**	$17,721	$22,230	-$4,502
	Utility (QALY)	0.739	0.800	-0.060
	ICER ($/QALY)	**$74,789**		
Scenario 2	**Cost ($)**	$27,558	$29,984	-$2,424
	Utility (QALY)	1.434	1.614	-0.180
	ICER ($/QALY)	**$13,438**		
Scenario 3	**Cost ($)**	$31,614	$36,754	-$5,139
	Utility (QALY)	2.086	2.033	0.052
	ICER ($/QALY)	**CsA is dominated**		

FIGURE 2: One-way Deterministic Sensitivity Analysis



Key Takeaways

INFLX dominated CsA in the base case and the third scenario, and was **found to be cost-effective in all scenarios** based on a $150,000 USD willingness-to-pay.

Results were most sensitive to **utility** derived from disease remission and the post-colectomy state, as well as medication and colectomy costs.

Though INFLX was found to be less costly due to higher probability of colectomy-free survival, payoff from increased survival and accrual of QALYs was not observed until the **third year** post-treatment.

Limitations

- Heterogeneity in study design and maintenance regimens
- Inputs were derived from studies in which differences in maintenance therapy were not accounted for and heterogenous

References

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