Budget Impact of Adding Peginterferon beta-1a to the Formulary for the Treatment of Relapsing Forms of Multiple Sclerosis

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OBJECTIVE

- To estimate the budget impact of adding peginterferon beta-1a for the treatment of relapsing forms of multiple sclerosis (MS) to a managed care organization (MCO) formulary in the United States (US).

BACKGROUND

- Peginterferon beta-1a is a pegylated interferon requiring subcutaneous injections every two weeks and indicated for the treatment of relapsing forms of MS.

METHODS

- A model was developed in Microsoft Excel to evaluate the budget impact over a 5-year time horizon of adding peginterferon beta 1a to the current mix of disease-modifying therapies (DMTs) for the treatment of relapsing forms of MS (Figure 1).
- The model compared the drug-related costs of the current mix of treatments with the costs of an estimated treatment mix with peginterferon beta-1a included on an MCO formulary for an MCO with 1,000,000 covered lives in 2014 with an annual growth rate of 0.8%.
- Based on an estimated prevalence of MS in the US of 0.21%[1] and an estimated 70% of those with relapsing forms of MS,[2] 2,100 people were estimated to have a diagnosis of MS, and 1,470 of those were estimated to be living with relapsing forms of MS in any given year. Of those with relapsing forms of MS, 80% (1,176) were assumed to be taking a DMT at any one time.
- Treatment share of peginterferon beta-1a was assumed to increase from 2.7% in 2014 to 7.0% in 2018, with this treatment share taken proportionately by treatment shares from other interferons indicated for MS (Table 1).
- Drug costs included acquisition costs adjusted by copayments or coinsurance rates and dispensing fees, as well as administration and monitoring costs based on estimated resource use and US unit costs (Table 2).
- Annual relapse treatment costs were estimated using the following:
  - Relapse rates from the peginterferon beta-1a phase 3 trial placebo groups
  - Relative risk reduction of a relapse for each DMT in the treatment mix derived using a mixed-treatment comparison analysis[4] (Table 3)
  - Average treatment cost for a relapse from Kobelt and colleagues[5] inflated to 2014 US dollars ($2,184.97)
- A one-way sensitivity analysis was performed changing key input parameter values.

RESULTS

- The estimated budget impact of adding peginterferon beta-1a to the formulary was negative for the first 5 years.
  - In 2014, with a treatment share of 2.7%, the estimated budget decrease was 0.07% of the total annual costs for DMT-related and relapse treatment costs and a decrease of $0.005 per member per month (PMPM).
  - In 2018, with a treatment share of 7.0%, the estimated budget decrease was also 0.23% of the total annual costs and a decrease of $0.014 PMPM (Table 4).
- Sensitivity analyses showed that the model was most sensitive to the acquisition costs of peginterferon beta-1a (Figure 2).

CONCLUSION

- Under model assumptions for treatment shares, adding peginterferon beta-1a to the MCO formulary would result in a small decrease in MCO costs for patients with relapsing forms of MS.

References

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Disclosures

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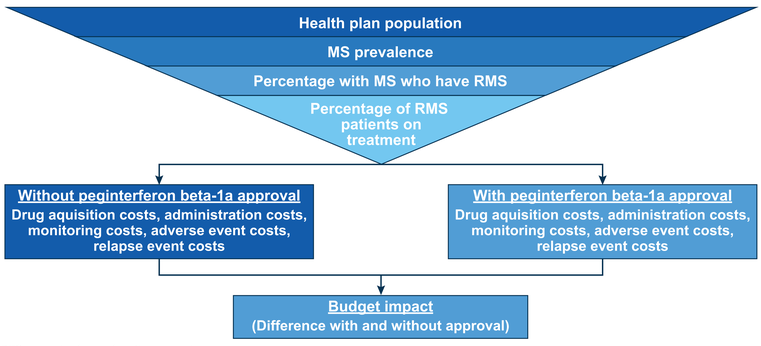
Figure 1. Budget-Impact Model Structure



RMS = relapsing forms of multiple sclerosis.

Table 1. Estimated Treatment Shares With Peginterferon Beta-1a in the Treatment Mix

Drug	2014	2015	2016	2017	2018
Peginterferon beta-1a	2.7%	6.6%	7.1%	7.0%	7.0%
Delayed-release dimethyl fumarate	22.2%	27.6%	31.3%	35.3%	36.4%
IFN beta-1a (intramuscular)	12.8%	7.4%	5.5%	4.2%	3.2%
IFN beta-1a (subcutaneous), 44 mcg	9.1%	6.7%	5.3%	4.4%	4.4%
IFN beta-1b (generic)	0.5%	0.6%	0.5%	0.4%	0.4%
IFN beta-1b (branded)	4.1%	2.8%	2.4%	2.0%	2.0%
Glatiramer acetate 20 mg	11.3%	6.6%	6.2%	5.2%	4.6%
Glatiramer acetate 40 mg	15.0%	17.3%	15.8%	14.4%	12.7%
Natalizumab	9.3%	9.4%	9.1%	8.3%	7.7%
Fingolimod	9.1%	10.6%	12.0%	13.3%	14.9%
Teriflunomide, 14 mg	3.9%	4.6%	5.1%	5.6%	6.7%
Total	100%	100%	100%	100%	100%

IFN = interferon.
Note: Without peginterferon beta-1a in the treatment mix, the treatment shares for the other interferons would be increased each year by the percentage market share for peginterferon beta-1a for that year.

Table 2. Annual Costs for Drug Acquisition, Administration, and Monitoring

Treatment	Acquisition Cost[a]	Administration Cost[b]	Monitoring Cost[b]	Adverse Event Cost[c]
Peginterferon beta-1a	$62,249.04	$33.83	$410.89	$50.91
Delayed-release dimethyl fumarate	$59,998.40	$0	$410.89	$0
IFN beta-1a (intramuscular)	$62.249.04	$33.83	$410.89	$53.08
IFN beta-1a (subcutaneous), 44 mcg	$67,505.37	$33.83	$410.89	$85.38
IFN beta-1b (generic)	$53,261.97	$33.83	$410.89	$90.37
IFN beta-1b (branded)	$63,288.82	$33.83	$410.89	$90.37
Glatiramer acetate 20 mg	$67,693.00	$33.83	$323.48	$0
Glatiramer acetate 40 mg	$60,543.32	$33.83	$323.48	$3.25
Natalizumab	$61,035.88	$2,691.62	$345.33	$0
Fingolimod	$63,487.62	$0	$345.33	$0
Teriflunomide, 14 mg	$63,089.11	$0	$366.47	$0

WAC = wholesale acquisition cost.
[a] Drug acquisition costs presented in this table were estimated as the WAC cost per pack multiplied by the number of packs per year; in the budget-impact calculations, these acquisition costs were adjusted down by the estimated copays ($50 per 28-day or 30-day supply for orals and self-injectables), coinsurance and coinsurance caps (20% for infusions with a cap of $5,000), and an additional dispensing fee ($3.50 per 28-day or 30-day supply) applied.
[b] Administration and monitoring costs for each DMT were estimated using resource use assumed to be needed to train and monitor self-administration for the injectable drugs and to administer infusions, as well as to monitor for efficacy and safety through physician visits and laboratory tests as recommended in the product prescribing information; standard US unit costs were applied to the resource use estimates.
[c] Adverse event costs only estimated for injection site necrosis (based on published data) and influenza-like symptoms assuming physician visit and over-the-counter drug; adverse event rates for these adverse events were taken from the US drug labels; since peginterferon beta-1a treated shares were only assumed to be taken from other interferons, these were the only adverse events assumed to change with its introduction.
Note: All costs reported in 2014 US dollars.
Source: Red Book, October 9, 2014.[3]

Table 3. Treatment Effect Parameters for Relapse Rate

Treatment	Relative Risk Annualized Relapse Rate[a] Mean (95% CI)
Peginterferon beta-1a	0.66 (0.50, 0.86)
Delayed-release dimethyl fumarate	0.53 (0.43, 0.65)
IFN beta-1a (intramuscular)	0.77 (0.68, 0.86)
IFN beta-1a (subcutaneous), 44 mcg	0.65 (0.57, 0.73)
IFN beta-1b (generic or branded)	0.69 (0.60, 0.80)
Glatiramer acetate 20 mg or 40 mg	0.65 (0.57, 0.72)
Natalizumab	0.34 (0.28, 0.42)
Fingolimod	0.45 (0.38, 0.53)
Teriflunomide, 14 mg	0.77 (0.66, 0.90)

CI = confidence interval.
[a] Estimated using a mixed-treatment comparison analysis.[4]

Table 4. Total Population Annual and PMPM Budget Impact of Adding Peginterferon beta-1a to the Formulary

Year	Total Population Annual Budget Impact (Percentage Decrease)	PMPM Budget Impact
2014	−$54,089 (−0.07%)	−$0.005
2015	−$136,471 (−0.18%)	−$0.012
2016	−$148,932 (−0.20%)	−$0.012
2017	−$152,517 (−0.20%)	−$0.012
2018	−$171,587 (−0.23%)	−$0.014

Figure 2. Results of the Sensitivity Analysis for Total Annual Budget Impact for Year 2017