neurocern

NEUROCERN IN ACTION

Predicting Cost of Care for a New Alzheimer's Disease Treatment Using Artificial Intelligence and Analytics

Using Neurocern, the cost of prescribing Biogen's new therapy for Alzheimer's can be reduced by 33%, resulting in more than $350M in savings over five years.

BACKGROUND

In 2021, Biogen announced the first ever treatment for Alzheimer's disease, a common neurological condition that impacts over 50 million patients globally. This medication, Adacanumab, currently costs more than $50,000 per person per year. With varying life expectancy among Alzheimer's patients, projecting the financial cost of care can be challenging.

Complicating the cost determination is the fact that Aducanumab is weight based and assumptions are based on an average weight of 163 pounds. Given global trends in obesity, $50,000 may underestimate the true financial burden of Adacanumab. Cost is also driven by disease prevalence.

KEY FACTS

- **More than $350M in savings** (over five years)
- **33% reduction in cost** (over five years)
- **More accurate eligibility screening**

- Biogen's Adacanumab costs more than $50,000 per person per year.
- Complex requirements for eligibility will make cost determinations challenging.
- The current standard of care will lead to costs upwards of $1.3B over five years.

Clinically, diagnostic sensitivity (premised on true positives in a particular population) for identifying mild cognitive impairment, and by proxy early dementia, among general medicine practitioners ranges from 14-61% among primary care doctors[1]. The same applies to false negatives[2,3].

Given the narrow clinical indications for Adacanumab, over- and underdiagnosis can adversely impact cost assumptions.

IMPLICATIONS FOR FINANCIAL MODELING

Understanding disease prevalence, severity, and predicted life expectancy of those with clinical indications for treatment may help more accurately forecast reserves and allocate treatment costs to those patients that truly qualify.

To showcase the value of applying an expert system, Neurocern's Aducanumab Eligibility Analytics Model was applied to claims data to identify individuals truly eligible for treatment.

As the provided table shows, the traditional clinical workflow is fraught with a high degree of false positives and false negatives and is void of the triaging of claim applications. In applying this traditional model to the Biogen example, 85% of claims are approved, resulting in a cost of care of $1.3 billion over five years for more than 30,000 potential claims.

	CURRENT STANDARD OF CARE	USING NEUROCERN AI SYSTEM
Total cost of Aducanumab treatment per person per year*	$50,000	**$50,000**
Duration of treatment+	5 years	**5 years**
ABC Insurance Company cost per person per year (20% of total cost of treatment)¥	$10,000	**$10,000**
Percent of patients with cognitive concerns that meet eligibility criteria	85%	**60%**
Total eligible claims	30,572	**30,572**
Total cost over 5 years	$1.3B	**$929M**
Total savings over 5 years	**--**	**> $350M**

* Assumed average cost of $50,000 per person per year | + Assumed mean duration of treatment of 5 years | ¥ Assumed estimated cost to ABC Insurance Company was 20% of the total cost of the drug

However, when Neurocern's AI expert system's is applied, we were able to enhance diagnostic accuracy. A triage score is computed to validate the veracity of the claims in terms of true positives, true negatives, false positives, and false negatives – this is premised on clinical data from an academic database (which also included brain autopsy findings), the current gold standard in diagnosis of Alzheimer's.

This research demonstrates Neurocern's ability to triage cognitive impairment more accurately, timely, and effectively than a general physician[4]. With diagnostic accuracy, a truer eligibility rate of 60% for Aducanumab was derived after filtering out the false positive and false negatives.

The five-year cost savings of employing Neurocern's expert system, as compared to the current standard of care, exceeded $350M – which represents a savings of approximately 33%.

As drug treatments emerge, their costs will dictate the importance of diagnostic accuracy; insurance carriers will want to identify those members truly eligible, both in terms of incidence and prevalence.

[1] Van den Dungen, P., et al. 2012, "The accuracy of family physicians' dementia diagnoses at different stages of dementia: a systematic review," International Journal of Geriatric Psychiatry 27:4, 342-354

[2] Bradford, A., et al. 2009, "Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors," Alzheimer Disease and Associated Disorders 23:4, 306-314

[3] Valcour, V. G., et al. 2000, "The detection of dementia in the primary care setting," Archives of Internal Medicine 160, 2964-2968

[4] Rao, A., and D. Naryanaswamy, 2018, "Validation of Neurocern's algorithms, identification of recoverable cognitive claims, and the financial implications for long-term care insurance carriers," Neurocern whitepaper

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sales@neurocern.com

neurocern.com

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