



# New Treatment Options for Alzheimer's and Dementia

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Alzheimer's disease was named after Alois Alzheimer, the German psychiatrist who first described the symptoms in 1906. The disease is the most common cause of dementia.

Dementia denotes a condition involving deterioration of mental faculties as a result of the disease. The term dementia comes from Latin and means "without mind". It is uncertain what causes dementia to develop, but it is most likely due to alterations in the brain. More than 200 diseases cause dementia, with Alzheimer's disease accounting for 60-70% of cases. There is currently no cure for the disease, and its progression can range from a few years to several decades until the patient dies from the disease.

The disease is caused by a build-up in the brain of two different proteins, beta-amyloid and tau. Beta-amyloid proteins accumulate between nerve cells, where they cause alterations and inflammation of the brain tissue. Tau proteins accumulate inside the nerve cells, causing damage that render the cells unable to communicate and subsequently destroying them. Alzheimer's disease thus destroys brain cells and causes the patient's brain to shrink. In the early stage of progression, the disease typically affects the areas of the temporal lobe involved in memory. Relatively quickly, other functions, including speech and motor function, also become impaired.

## **New, innovative Treatments may be on the Way**

We have no drugs that can cure Alzheimer's today, but pharmaceutical companies including Eli Lilly, Biogen and Novo Nordisk are attempting to develop innovative new treatments. Eli Lilly and Biogen have developed drug-based treatments aimed at affecting and preventing the brain's production of beta-amyloid proteins, while Novo Nordisk's drug GLP-1 prevents the production of tau proteins and inflammation of nerve cells.

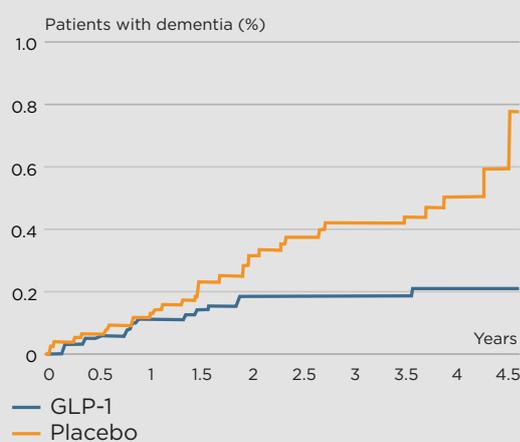
Eli Lilly has successfully tested the efficacy of its drug in a phase 2 trial on a narrow group of patients and is currently in dialogue with the U.S. Food and Drug Administration on the design of the pivotal phase 3 trial.



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Novo Nordisk's GLP-1 products for the treatment of Alzheimer's disease were originally developed to treat diabetes, and over the course of the summer we expect the drug to be approved for treatment of obesity, as well. In treating diabetes patients with GLP-1, Novo Nordisk found that these patients had a significantly lower risk of Alzheimer's and dementia than patients who had not been administered GLP-1 – see figure 1 below.

**Figure 1: Lower Risk for Dementia with GLP-1**



In three large trials with data from more than 15,000 patients, Novo Nordisk has demonstrated that its GLP-1 drug reduced the risk of dementia by some 50% in these patients. Novo Nordisk has also studied the use of GLP-1 via the Danish nationwide health registry and the US Truven claims database. In the Danish nationwide registry, there were 470,000 observations, and in the US database over 300,000 observations. The conclusion from the two databases is that the Danish data indicate a 25% lower risk of developing dementia after 2.5 years, while the US data indicate about 30% lower risk of dementia after 2 years.

We are closely following the development of new treatment options. Both because the potential demand for a curative drug will be considerable, and because an effective treatment could substantially reduce patient care costs, which are set to rise in the coming decades due to demographic developments.

The authorities' evaluation of Biogen's drug will be known shortly, but there are indications that this treatment may have limited effect. The final trial results from Eli Lilly and Novo Nordisk will not be released for another three years or so, but there will be a great potential for any company that manages to crack the Alzheimer's code. A potential and a success which has so far eluded all.

# Facts about Alzheimer's Disease and Dementia

## 1.

In 2019, the UN estimated that there are over 50 million people living with Alzheimer's or other types of dementia globally. This figure is expected to increase to about 150 million by 2050 due to a combination of a lack of effective treatments and a growing number of elderly people. (Source: WHO)

## 2.

Alzheimer's and other types of dementia are not only serious conditions for patients and their loved ones, they also take up an enormous amount of healthcare resources. The global cost of treating and caring for Alzheimer's patients is currently about USD 1 trillion. (Source: Patterson C. World Alzheimer Report 2018)

## 3.

In the USA, the annual cost of care and treatment is some USD 300 billion and is expected to rise to USD 1.1 trillion by 2050. This represents 1.3% of the US GDP, and without new treatments this percentage is set to rise to some 2.2% by 2050. (Source: The US Alzheimer's Association)

## 4.

At present, there is no cure for Alzheimer's, only various types of drugs that can ease the dementia process.

## 5.

In the past 25 years, 99.9% of all medical trials for drugs to cure Alzheimer's/dementia have been unsuccessful. At present, there are five approved types of drugs to treat Alzheimer's/dementia, none of which have any significant curative effect. No new drug has been approved since 2003. (Source: FDA)

## 6.

The three pharmaceutical companies Eli Lilly, Biogen and Novo Nordisk currently have drugs in phase 2 or phase 3 clinical trials. (Source: FDA)

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