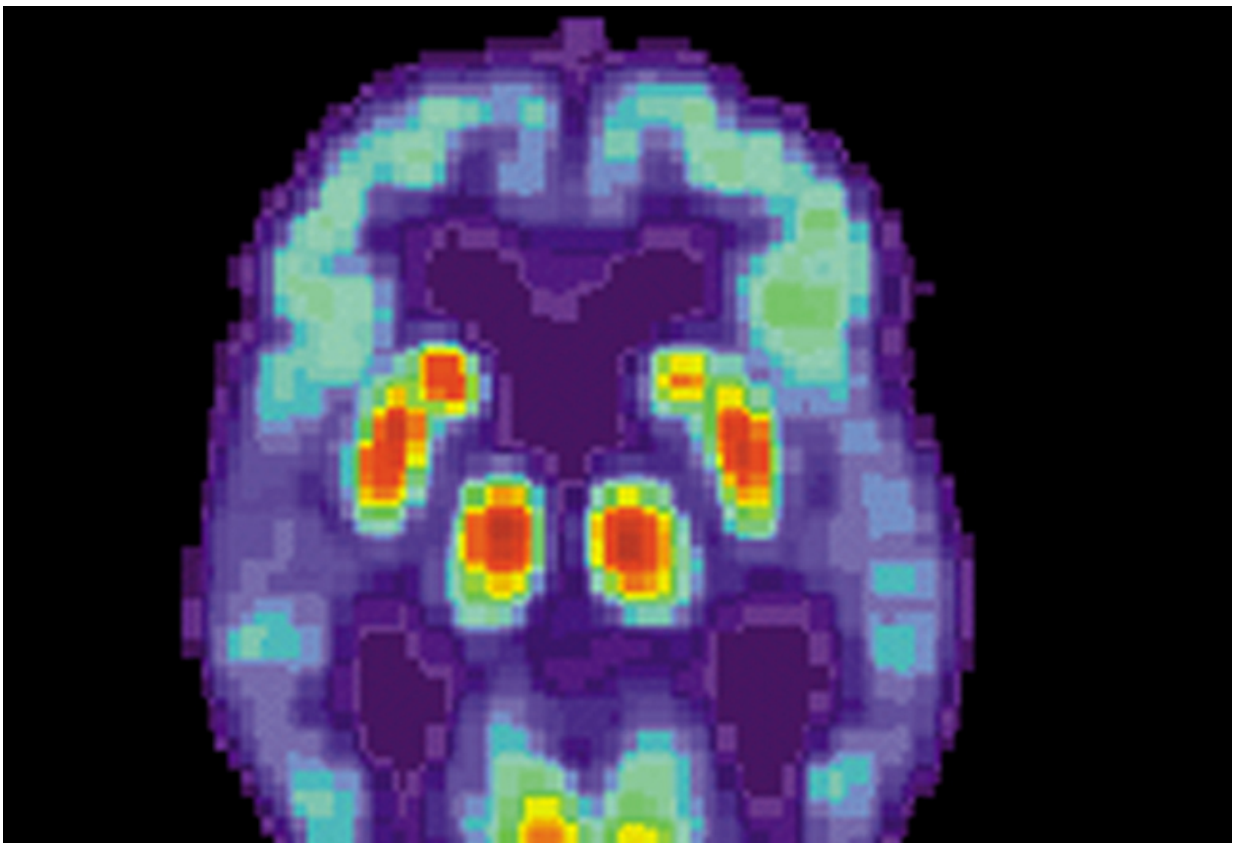


Alzheimer's may have once spread from person to person, but the risk of that happening today is incredibly low

February 4 2024, by Steve Macfarlane



PET scan of a human brain with Alzheimer's disease. Credit: public domain

An article published this week in the journal [Nature Medicine](#) documents

what is believed to be the first evidence that Alzheimer's disease can be transmitted from person to person.

The finding arose from long-term follow up of patients who received [human growth hormone](#) (hGH) that was taken from [brain tissue](#) of deceased donors.

Preparations of donated hGH were used in medicine to treat a variety of conditions from 1959 onwards—including in Australia from the mid 60s.

The practice stopped in 1985 when it was discovered around 200 patients worldwide who had received these donations went on to develop [Creutzfeldt-Jakob disease](#) (CJD), which causes a rapidly progressive dementia. This is an otherwise extremely rare condition, affecting roughly one person in a million.

What's CJD got to do with Alzheimer's?

CJD is caused by prions: infective particles that are neither bacterial or viral, but consist of abnormally folded proteins that can be transmitted from cell to cell.

Other prion diseases include kuru, a dementia seen in New Guinea tribespeople caused by eating human tissue, scrapie (a disease of sheep) and variant CJD or bovine spongiform encephalopathy, otherwise known as [mad cow disease](#). This raised [public health concerns](#) over the eating of beef products in the United Kingdom in the 1980s.

Human growth hormone used to come from donated organs

Human growth hormone (hGH) is produced in the brain by the [pituitary gland](#). Treatments were originally prepared from purified human pituitary tissue.

But because the amount of hGH contained in a single gland is extremely small, any single dose given to any one patient could contain material from around [16,000 donated glands](#).

An average course of hGH treatment lasts around four years, so the chances of receiving contaminated material—even for a very rare condition such as CJD—became quite high for such people.

hGH is now manufactured synthetically in a laboratory, rather than from human tissue. So this particular mode of CJD transmission is no longer a risk.

What are the latest findings about Alzheimer's disease?

The *Nature Medicine* paper provides the first evidence that transmission of Alzheimer's disease can occur via human-to-human transmission.

The authors examined the outcomes of people who received donated hGH until 1985. They found five such recipients had developed early-onset Alzheimer's disease.

They considered other explanations for the findings but concluded donated hGH was the likely cause.

Given Alzheimer's disease is a much more common illness than CJD, the authors presume those who received donated hGH before 1985 may be at higher risk of developing Alzheimer's disease.

Alzheimer's disease is caused by presence of two abnormally folded proteins: amyloid and tau. There is [increasing evidence](#) these proteins spread in the brain in a [similar way to prion diseases](#). So the mode of transmission the authors propose is certainly plausible.

However, given the amyloid protein deposits in the brain [at least 20 years](#) before clinical Alzheimer's disease develops, there is likely to be a considerable time lag before cases that might arise from the receipt of donated hGH become evident.

When was this process used in Australia?

In Australia, donated pituitary material [was used](#) from 1967 to 1985 to treat people with short stature and infertility.

[More than 2,000 people](#) received such treatment. Four developed CJD, the last case identified in 1991. All four cases were likely linked to a single contaminated batch.

The risks of any other cases of CJD developing now in pituitary material recipients, so long after the occurrence of the last identified case in Australia, are [considered to be](#) incredibly small.

Early-onset Alzheimer's disease (defined as occurring before the age of 65) is uncommon, accounting for [around 5%](#) of all cases. Below the age of 50 it's rare and likely to have a genetic contribution.

The risk is very low—and you can't 'catch' it like a virus

The *Nature Medicine* paper identified five cases which were diagnosed in people aged 38 to 55. This is more than could be expected by chance,

but still very low in comparison to the total number of patients treated worldwide.

Although the long "incubation period" of Alzheimer's disease may mean more similar cases may be identified in the future, the absolute risk remains very low. The main scientific interest of the article lies in the fact it's first to demonstrate that Alzheimer's disease can be transmitted from person to person in a similar way to [prion diseases](#), rather than in any public health risk.

The authors were keen to emphasize, as I will, that Alzheimer's cannot be contracted via contact with or providing care to people with Alzheimer's disease.

More information: Gargi Banerjee et al, Iatrogenic Alzheimer's disease in recipients of cadaveric pituitary-derived growth hormone, *Nature Medicine* (2024). [DOI: 10.1038/s41591-023-02729-2](https://doi.org/10.1038/s41591-023-02729-2)

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