

Distinguishing differences in dementia using brain scans

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Neuroscientist Anne Hafkemeijer is able to distinguish two different forms of dementia using advanced imaging techniques. This is the first step towards early recognition of dementia in patients on the basis of brain networks.

Early diagnosis

In her PhD research Hafkemeijer used MRI scans to detect changes in brain networks that occur as a result of ageing and dementia. She studied both the structure and the function of these networks. What do these brains look like and how does their function change as people age or suffer from dementia? Previously, people looked mainly at separate areas of the brain, but cognitive functions, such as memory, are not located in one area of the brain. As these functions are the result of [brain areas](#) working together, it is very important to be able to study the areas in detail. The research findings help us make a distinction between different forms of dementia. Early detection is important for the patient, his environment, the treatment plan and the prognosis.

Using advanced techniques

Hafkemeijer is a specialist in the methodology and statistics of psychology and she conducted her research in partnership with the LUMC, the Amsterdam VUmc and the Erasmus MC Rotterdam. "Each specific form of dementia has its own development course and

symptoms," Hafkemeijer explains. She studied two of these forms. "With Alzheimer's, memory declines whereas [frontotemporal dementia](#) affects the front part of the brain. These changes cause a noticeable change in behaviour. We used new advanced imaging techniques to show these changes in the brain."

Differences in dementia are hard to distinguish

Hafkemeijer explains: "Although each form of dementia has its own symptoms, there is a lot of overlap between them. We wanted to use brain scans to study whether the [brain networks](#) are different in these two forms. Particularly in the early stages of the condition it is difficult to distinguish between them. That's why it is currently not possible to make an [early diagnosis](#)."

Dementia patients classified individually

This research makes it possible to distinguish the group of Alzheimer's patients from those with frontotemporal dementia. Individual recognition is not always possible. Hafkemeijer sees her research findings as a first step towards an individual classification of dementia and an earlier diagnosis for [dementia](#) patients. She will shortly be applying these advanced imaging techniques in the clinical environment, advising brain researchers within Leiden University, the Leiden Institute for Brain and Cognition and the LUMC and supporting them with their MRI research and analyses.

Provided by Leiden University

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