

# by how much does Chronic Kidney Disease increase the risk of Alzheimer's Disease

Chronic kidney disease (CKD) is associated with a **modest increased risk of Alzheimer's disease (AD)**, though study results vary. Key findings from recent research include:

- A **14% higher risk** of AD in CKD patients (adjusted hazard ratio [HR] = 1.14, 95% confidence interval [CI]: 1.08–1.20) based on a 15,756-person cohort study<sup>[1]</sup>.
- A meta-analysis showing a **28% increased odds** of combined dementia, AD, and cognitive impairment in individuals with CKD (odds ratio [OR] = 1.28, 95% CI: 0.95–1.28), though this result was marginally non-significant ( $p = 0.063$ )<sup>[2]</sup>.
- A 2024 study of 952 CKD patients found **no statistically significant association** between CKD and AD after adjusting for confounders (HR = 1.31, 95% CI: 0.40–4.24)<sup>[3]</sup>.

## Conflicting Evidence

While some studies report elevated AD risk<sup>[1] [4]</sup>, others suggest CKD is more strongly linked to **vascular dementia** or general cognitive impairment<sup>[5] [6]</sup>. For example:

- CKD was associated with a **2.01-fold higher risk of all-cause dementia** and a **3.98-fold increased risk of Parkinson's disease**, but not AD, in a 2024 analysis<sup>[3]</sup>.
- A 2023 study found reduced kidney function correlated with dementia biomarkers but not AD specifically<sup>[7]</sup>.

## Mechanisms and Considerations

The relationship may depend on CKD severity, comorbidities (e.g., hypertension, diabetes), and shared pathways like vascular damage, uremic toxin accumulation, and systemic inflammation<sup>[8] [9]</sup>. Notably, **vascular factors** likely explain much of the observed association with dementia subtypes other than AD<sup>[5] [9]</sup>.

In summary, CKD appears to moderately elevate AD risk in some populations, but the evidence remains inconsistent, with stronger links to non-AD dementias. Further research is needed to clarify causality and underlying mechanisms.

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1. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10295691/>
2. <https://www.nature.com/articles/s41440-024-01599-6>
3. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11204683/>
4. <https://www.nature.com/articles/s41598-024-74420-6>

5. <https://www.neurology.org/doi/10.1212/WNL.00000000000012113>
6. <https://www.mdpi.com/2075-4426/14/6/597>
7. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2800717>
8. <https://karger.com/kdd/article/8/4/275/824550/Chronic-Kidney-Disease-and-Cognitive-Impairment>
9. <https://www.nature.com/articles/s41581-020-0266-9>