

# **Cognitive Dysfunction in Hemodialysis Patients**

**Thesis**

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in Neuropsychiatry*

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## ***List of Abbreviations***

<b>Abb.</b>	<b>Description</b>
<b>AD</b>	Alzheimer's disease
<b>AKI</b>	Acute kidney injury
<b>AMPA</b>	Amino-3-hydroxy-5-methyl-soxazolepropionic acid
<b>APOE-4</b>	The APOE-4 allele
<b>BMI</b>	Basal metabolic index
<b>BP</b>	Blood pressure
<b>Ca</b>	Serum calcium
<b>CAPD</b>	Continuous ambulatory peritoneal dialysis
<b>CKD</b>	Chronic kidney disease
<b>CKD5D</b>	Chronic kidney disease stage 5 dialysis
<b>CKD-MBD</b>	Chronic kidney disease-mineral and bone disorder
<b>COWAT CF</b>	Controlled oral word association test-category fluency
<b>COWAT CS</b>	Controlled oral word association test-category switching
<b>CST</b>	Cognitive stimulation therapy
<b>CT</b>	Computerized tomography
<b>CVD</b>	Cardiovascular disease
<b>DKD</b>	Diabetic kidney disease
<b>DM</b>	Diabetes mellitus
<b>DVT</b>	Deep venous thrombosis
<b>EEG</b>	Electroencephalogram
<b>ESRD</b>	End-stage renal disease

<b>Abb.</b>	<b>Description</b>
<b>FAB</b>	Frontal assessment battery
<b>GBD</b>	Global burden of disease
<b>GFR</b>	Glomerular filtration rate
<b>HD</b>	Hemodialysis
<b>HDL</b>	High-density lipoprotein
<b>HRBNT</b>	Halstead reitan battery of neuropsychological test
<b>HTN</b>	Hypertension
<b>IHD</b>	Ischemic heart disease
<b>Il-6</b>	Interleukin factor 6
<b>IQs</b>	Intelligence Quotients
<b>KBDI</b>	Korean beck depression index
<b>KDIGO</b>	Kidney disease: improving global outcomes
<b>KMMSE</b>	Korean mini-mental state examination
<b>MCI</b>	Mild cognitive impairment
<b>MMSE</b>	Mini-mental state examination
<b>MRI</b>	Magnetic resonance imaging
<b>NMDA</b>	N-methyl-daspartate
<b>non-CKD</b>	Non chronic kidney disease
<b>P</b>	Serum phosphorus
<b>PD</b>	Peritoneal dialysis
<b>PH</b>	Past history
<b>PTH</b>	Parathyroid hormone
<b>ROD</b>	Renal osteodystrophy
<b>RRT</b>	Renal replacement therapy
<b>T1</b>	Time 1

<b>Abb.</b>	<b>Description</b>
<b>T2</b>	Time 2
<b>T3</b>	Tri-iodo-thyronin
<b>T4</b>	Tetra-iodo-thyronin
<b>tHcy</b>	Homocysteine
<b>TIA</b>	Transient ischemic attack
<b>TMT A</b>	Trail making test A
<b>TMT B</b>	Trail making test B
<b>US</b>	United states
<b>VLDL</b>	Very-low-density lipoprotein
<b>WMS-R</b>	Wechsler memory scale revised

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## Abstract

**Background:** Chronic kidney disease (CKD) is a worldwide growing health problem that is frequently associated with cognitive deficits. **The aim of our study** was to characterize the pattern of cognitive functioning of adults with CKD on regular hemodialysis. We also aimed to evaluate the potential effect of a single dialysis session on cognitive function. **Subject and methods:** Our study included thirty CKD patients on regular hemodialysis and twenty comparison subjects matched for age, sex and education and co-morbid conditions. To assess changes over the dialysis cycle, we assessed HD patients immediately before and again 24 hours post-dialysis. **The results:** regards MMSE all patients had normal results, as regards trail A 93% of patients had abnormal results, as regards trail B 67% of patients had abnormal results, as regards logical memory A 43% of patients had abnormal results, and regarding logical memory B 13% of patients had abnormal results. A highly significant cognitive impairment detected in hemodialysis patients regarding memory, attention and executive functions compared to non CKD individuals. However, a single dialysis session improved several aspects of cognitive function. **Conclusion:** Our findings demonstrated that among adults with CKD5D, lower cognitive performance is common, compared with non-renal subjects. Even more severely affected were executive functions. In addition, this study showed that a single dialysis session improves several aspects of cognitive function.

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**Keywords:** Conginitive impairment, Hamodialysis, Chronic kidney disease.



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# Introduction

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# *Aim of the Work*

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# Chapter (1)

## **Cognition**

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## Chapter (2)

# **Chronic Kidney Disease and Hemodialysis**

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