Master (MSc) in Clinical Neuropsychology

Huub A.M. Middelkoop, Professor of clinical neuropsychology

LUMC Neurology & Neuropsychology
UL Neuropsychology

https://twitter.com/huubmiddelkoop
http://www.fsw.leidenuniv.nl/psychologie/organisatie/gmn/

Clinical neuropsychologists are experts in psychology as applied to neurological conditions, i.e. brain illness, neurodevelopmental disorder, neurodegeneration or brain injury
Why study **clinical neuropsychology**?

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You are interested in:

*brain/behavior relationships*: how does the healthy and impaired brain function? (neurobiology, modelling, development and implementation of methods/instruments)

classification (diagnostics), prediction (prognostics) and/or modification (therapy, training, rehabilitation) of normal / disturbed behavior.

and you want to be professionally active in:

University medical centres (UMCs) and general hospitals
Rehabilitation centres
Mental health services (GGZ, Psychiatry)
Pediatric and Geriatric health care facilities
Research centres, e.g. university, TNO, RIVM
Forensic setting
Pharmaceutical industry: CNS division
Profit and non-profit sector: assessment centres, government, commercial enterprises, etc.
Private practice, ???

3 major career tracks
1. Health care: BA > Msc CNP (1y)> GZ-Psychologist (2y)> Clinical (neuro)psychologist (4y)
2. (Clinical) research: BA > Msc CNP (1y)> PhD (4y)
3. Other: BA > Msc CNP (1y)>
Brain lesions ↔ functional lesions

No association between fibrosis on magnetic resonance imaging at return to play and hamstring reinjury risk. Am J Sports Med. 2015 May;43(5):1228-34. Reurink GI et al.
CNP: behavioral consequences of (organic/functional) brain dysfunction: assessment, diagnosis, treatment and rehabilitation

### Organic brain disorders

- Genetic and neurodevelopmental disorders
  - mental retardation, ADHD, dyslexia, Angelman, Prader-Willie syndrome
- Cerebrovasculopathy / CVA
- Traumatic brain injury
- Neurointoxication
  - alcohol, solvents, drugs
- Psychiatric disorders
  - depression, anxiety, schizophrenia
- Neurodegeneration
  - Lewy body disease, Parkinson’s, Huntington’s, Alzheimer’s disease
- Other
  - HIV, tumor cerebri, epilepsy, (metabolic) encephalopathy, brain infection, hydrocephalus, radiation

### Functional brain disorders

- Psychopathology

Clinical relevance: 1 out of 5 people will suffer from brain disease!

### (Neuro)psychological impairments

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Emotional status</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>attention and concentration problems</td>
<td>anxiety, depression</td>
<td>apathy, disinhibition</td>
</tr>
<tr>
<td>amnesia</td>
<td>delusion, hallucinations</td>
<td>delusion, hallucinations</td>
</tr>
<tr>
<td>aphasia</td>
<td>personality change</td>
<td>personality change</td>
</tr>
<tr>
<td>agnosia, apraxia</td>
<td>sensory, motor and autonomic</td>
<td>sensory, motor and autonomic</td>
</tr>
<tr>
<td>executive dysfunction</td>
<td>nervous system disturbances</td>
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</tbody>
</table>

Discover the world at Leiden University
Role and value of clinical neuropsychology

- **Fundamental (clinical) research** of normal and pathological brain/behavior relationships
- **Selection and description of (patient) study populations** *(cognitive genetics, fenotyping)*
- **Research, development and evaluation of (clinical) research instruments** *(validation, reliability, applicability, normative data)*
- **Contribution to medical diagnostic work-up**: assessment of neuropsychological dysfunction indicative for organic brain disease
- **(Neuro)psychological function analysis**: description of neuropsychological impairments and their consequences for daily functioning
- **(Neuro)psychological interventions**: treatment of patients with cognitive and/or behavioral disorders as result of (organic) brain disease *(cognitive rehabilitation)*
- **Quantitative evaluation** of (non)pharmacological interventions
Early Alert

Alzheimer’s Home Screening Test

Early detection can lead to early treatment and improved quality of life.

- Self-administered
- Painless and non-invasive
- Simple and easy to use
- Results in 5 minutes

Have you ever wondered?™

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CNP program (60 EC)

>>> entry requirement: BA Psychology with Kolb & Wishaw Neuropsychology

- **Courses (20 EC):**
  - Adult and old-age Clinical Neuropsychology: theory (5 EC) & practice (5 EC)
  - Child Clinical Neuropsychology: theory (5 EC) & practice (5 EC)

  And

  - Clinical neuropsychological interventions: theory (5 EC) & practice (5 EC)

- **Thesis (20 EC)**

- **Internship (20 EC) or 10 ECTS internship and 10 ECTS elective courses (e.g. A&O or Child Clinical neuropsychology theory**
Course content (60 EC)

Key issues

*Brain/behavior relationships*: how does the healthy and impaired brain function? (neuro(patho)(physio)logy, modelling, development and implementation of methods/instruments)

Classification (diagnostics), prediction (prognostics) and/or modification (therapy, training, rehabilitation) of normal / disturbed behavior.

- Lifespan: child, adult, old-age clinical neuropsychology
- Genetics, neuropathology, functional neuroanatomy, brain (patho)physiology
- Diagnostic work-up and treatment of major neurological and psychiatric disorders (mental status examination, DNA testing, MRI, EEG, psychopharmacology etc.)
- Neuro(psycho)logical disorders: developmental, acute, reversible, degenerative
- Clinical neuropsychology: diagnostics, prognostics, treatment and rehabilitation
- Evidenced-based and multidisciplinary approach
- Professional and medical ethical issues

Assessment & Intervention skills (patient and/or care giver)

- Indicating, observation, history taking, (neuro)psychological examination > etiological, functional diagnosis and treatment options
- Neuropsychological interventions: psycho-education, cognitive-, behavioral- and system therapy, case management, neurorehabilitation (strategy and function), neuro feedback
- E–diagnostics, E-psychotherapy, E-function training, E-care giver management
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Scientist-practitioner
Thesis: memory activation and EEG in Alzheimer’s disease
Master thesis topics (20 EC)

- Smaller grey matter and brainstem volumes associated with diminished cognitive performance in children with Duchenne muscular dystrophy: a pilot study
- Depression six months after aneurysmal subarachnoid haemorrhage
- Cardiovascular disease load and cerebral small vessel disease in cognitive profiles in Alzheimer patients
- Irritability and executive functioning in Huntington’s disease
- The association between prenatal cannabis use and visual spatial processes in six to eight year old children
- In vivo magnetic resonance imaging of amyloid-B deposition in patients with probable Alzheimer’s disease
- Effectiveness of the Patient Education Program for patients with manifest Huntington’s disease
- Patient satisfaction at the LUMC department of Neuro Intensive Care
- Need for psychosocial treatment of patients with Parkinson’s disease
- The effect of sleep deprivation on cognitive flexibility in rats
- Cognitive functioning in Rheumatoid Arthritis

Check PUBMED for professor Middelkoop’s clinical research projects at the Department of Neurology & Clinical Neuropsychology of the LUMC: http://www.ncbi.nlm.nih.gov/pubmed/?term=middelkoop-ha
Clinical practice: the neuropsychological examination
- **Courses:**
  - Adult and old-age Clinical Neuropsychology: theory & practice
  - Clinical neuropsychological interventions: theory & practice
  - Elective: Child Clinical Neuropsychology: theory
  - Elective: Trainers Course Communication Skills (HP)

- **Thesis:**
  The association between orthostatic hypotension and cognition in a 75+ population on antihypertensive medication*

  *LUMC departments Neuropsychology, Neuroradiology, General Practice, Internal Medicine, Psychiatry, Neurology

- **Internship:**
  Neuro-feedback: diagnostic work-up and training
  *Brain Center Amsterdam*
## CNP Program: 1st semester

<table>
<thead>
<tr>
<th>1st semester</th>
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<tbody>
<tr>
<td>37</td>
<td>38</td>
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<tr>
<td><strong>Adult and old-age clinical neuropsychology:</strong> T&amp;A</td>
<td>10</td>
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<tr>
<td><strong>Adult and old-age clinical neuropsychology:</strong> CP</td>
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**Start Master’s Thesis (choose topic, read literature, etc)** 20

**Optional: Electives**

[https://studiegids.leidenuniv.nl/studies/show/5977/psychology_clinical_neuropsychology?_ga=2.177720486.2046970700.1520874620-874253916.1520874620](https://studiegids.leidenuniv.nl/studies/show/5977/psychology_clinical_neuropsychology?_ga=2.177720486.2046970700.1520874620-874253916.1520874620)

CNP Program: 2\(^{nd}\) semester

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<td><strong>Intervention strategies in clinical neuropsychology</strong></td>
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<tr>
<td><strong>Master’s Internship</strong></td>
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[Link to electives](https://studiegids.leidenuniv.nl/studies/show/5977/psychology_clinical_neuropsychology?_ga=2.177720486.2046970700.1520874620-874253916.1520874620)

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Why study **Clinical Neuropsychology** in **LEIDEN**?

- Leiden Neuropsychology master is uniquely linked with patient care and clinical research
- Neuropsychology across the life-span: child, adult and old-age Neuropsychology
- Diagnostics *and* interventions.
- Teaching by clinically active and qualified neuropsychologists
- Outstanding facilities (LUMC <-> FSW)
- Oldest and largest Neuropsychology department in the NL
- Leiden University= research intensive and ‘intimate’ top university
Any questions?