Huntington’s Disease Dementia

Dementia Neuropsychology · https://neuro.vip/neuropsychology/dementia-neuropsychology/huntingtons-disease-dementia/

Huntington’s disease (HD) is a hereditary, **progressive neurodegenerative disorder** characterised by the **triad of motor, cognitive, and psychiatric symptoms**. The development of dementia is an inevitable aspect of HD for most patients who live into late adulthood. For clinical neuropsychologists, early recognition, detailed characterisation, and nuanced understanding of Huntington’s disease dementia (HDD) are essential for diagnosis, prognosis, and care planning.

Huntington’s Disease and Its Dementia

Genetic and Neuropathological Background

- **Genetics:** HD is an autosomal dominant disorder caused by an expanded CAG trinucleotide repeat on the huntingtin gene (chromosome 4). The number of repeats correlates inversely with age of onset and severity.
- **Neuropathology:** The earliest and most severe degeneration occurs in the **striatum** (especially caudate nucleus and putamen), then spreads to widespread **subcortical and cortical brain regions**.
- **Neurotransmitter changes:** Multiple neurotransmitter systems (**dopaminergic, GABAergic, cholinergic**) are disrupted, underlying the multifaceted symptoms.

Brain Imaging in Huntington's Disease

Embedded media: https://radiopaedia.org/cases/29262/play?lang=gb



A "diagnosis certain" case of Huntington's Disease in a 57 year old © Radiopaedia

Clinical Manifestations of Huntington’s Disease Dementia

Huntington’s dementia does not fit the classic cortical dementia profile (such as Alzheimer’s disease) nor is it only a subcortical dementia; rather, it reflects a unique constellation of deficits strongly influenced by damage to fronto-striatal circuits.

Cognitive Profile in Huntington’s Disease Dementia

- **Executive Dysfunction:**
  - **Impaired mental flexibility:** Difficulty shifting between tasks or changing strategies.
  - **Poor problem solving and planning:** Trouble organising, sequencing, or controlling goal-directed behaviour.
  - **Impaired judgement and impulsivity:** Acting without foresight, poor risk assessment, or difficulty anticipating consequences.
- **Reduced attention and processing speed:**
  - **Bradyphrenia:** Noticeable slow thinking and reduced cognitive efficiency, even in early stages.
  - **Distractibility:** Difficulty maintaining focus and sustaining attention.
- **Memory Impairment:**
  - **Retrieval deficits predominate:** Inconsistent recall and poor learning strategies, with relatively spared recognition memory in early phases.
  - **Rapid forgetting uncommon:** More often, poor encoding and retrieval rather than true amnesia.
- **Visuospatial and constructional difficulties:**
  - **Impaired visual scanning and perception:** Trouble organising visual information or interpreting complex scenes.
  - **Difficulty with mental manipulation:** Problems rotating objects or visualising spatial relationships.
- **Language Changes:**
  - **Poverty of spontaneous speech:** Reduced initiation and elaboration.
  - **Verbal fluency deficits:** Problems generating words under time pressure.
  - **Motor speech disturbance:** Dysarthria with slurred, imprecise, or slowed speech.

Psychiatric and Behavioural Features of Huntington’s Disease Dementia

- **Depression and Apathy:** Up to half of HD patients develop significant depression, often compounded by apathy and emotional blunting.
- **Irritability and Disinhibition:** Reduced social tact, anger outbursts, or sexually inappropriate behaviour can be prominent.
- **Obsessive-compulsive tendencies:** Repetitive thoughts or behaviours, intrusive ruminations.
- **Anxiety and suicidality:** Increased risk, especially in younger patients and those with insight into the diagnosis.
- **Psychosis:** Paranoid delusions, misidentifications, or—rarely—hallucinations.

Motor Symptoms: Impact on Neuropsychological Assessment of Huntington’s Disease Dementia

Motor features are central to the clinical presentation of HD and have direct relevance for cognitive assessment:

- **Chorea:** Involuntary, dance-like, writhing movements that fluctuate in severity and interfere with motor-based cognitive tests.
- **Dystonia and rigidity:** Slowed, stiff, or twisted movements, especially as disease advances.
- **Impaired eye movements and dysarthria:** Affects reading, tracking, and verbal output.
- **Difficulty with tasks requiring fine motor skill, drawing, writing, or sustained muscle contraction** (motor impersistence).

Course and Progression of Huntington’s Disease Dementia

- **Onset:** First symptoms are usually behavioural or mild cognitive change, followed by subtle motor abnormalities—especially gait disturbance, clumsiness, or fidgeting.
- **Progression:** Cognitive impairment worsens steadily, with eventual loss of independence. Motor and psychiatric symptoms also progress.
- **Insight:** Patients often lack awareness of motor and cognitive changes, possibly due to fronto-striatal dysfunction.

Gene Therapy seems to slow Huntington disease - NEW RESEARCH

In 2025, a drug which alters the cell's ability to make huntingtin protein was said to "reduce the progression of Huntington symptoms by 75% over 3 years in 12 people who had received it versus a comparison group".

Neuropsychologist’s Role in Diagnosis and Management of Huntington’s Disease Dementia

Comprehensive Assessment

- **Early detection:** Subtle executive dysfunction or slowing may precede overt motor or psychiatric symptoms.
- **Profile of impairment:** Careful neuropsychological assessment helps to identify a “dysexecutive” profile with preserved orientation and simple recall, but major challenges in organisation, attention, verbal fluency, and shifting.
- **Functional implications:** Evaluate safety, capacity for complex tasks, and need for supervision as dementia progresses.
- **Motor and psychiatric confounds:** Select tests to minimise the confound of involuntary movements or mood disturbance; supplement performance-based testing with informant and observational data.

Differential Diagnosis in Huntington’s Disease Dementia

- **Versus Alzheimer’s disease:** AD is dominated by episodic memory impairment and rapid forgetting, typically sparing motor and behavioural domains early on.
- **Versus frontotemporal dementia:** Overlapping behaviour and executive dysfunction, but the presence of chorea and family history are characteristic for HD.
- **Versus pseudodementia (depression):** Mood disorders can cause cognitive slowing, but true dementia in HD requires evidence of global impairment and functional loss.
- **Versus vascular dementia and other subcortical dementias:** Vascular pathology may present similarly, but HD has a definitive genetic basis and distinct motor-psychiatric profile.

Management and Support

- **Patient and family education:** Clearly communicate the progressive nature, expected challenges, and genetic implications of HD.
- **Compensatory strategies:** Recommend routine, structured environments, external cues, carer supervision, and task simplification as needed.
- **Mood and behaviour support:** Screen regularly for depression, agitation, and suicidality; collaborate with psychiatry and neurology for medication management.
- **Decision-making capacity:** Re-evaluate regularly; dementia, impulsivity, and lack of insight can impair legal and financial capacity.
- **Caregiver guidance:** Prepare families for progression, communicate about risk of behavioural escalation, safety concerns, and carer burden.

Multidisciplinary Approach

HD care requires close liaison with neurologists, psychiatrists, speech and language therapists, occupational therapists, social workers, and genetic counsellors. Neuropsychologists contribute uniquely with detailed cognitive profiling, behaviour assessment, and practical recommendations for care and safety.

Practical Issues for Assessment of Huntington’s Disease Dementia

- **Adapt testing to motor and speech compromise:** Use untimed tasks, allow for extra time, and prioritise tasks less affected by chorea or rigidity.
- **Supplement with qualitative data:** Observation, informant input, and behaviour in clinical settings are vital, as performance may be heavily confounded by movement or motivation.
- **Address medication effects:** Antipsychotics or antidepressants commonly used in HD may themselves impact cognition.
- **Attend to the family context:** Many families are dealing with multiple affected members, grief, and genetic uncertainty.

Conclusion

Huntington’s disease dementia is a complex, progressive disorder combining fronto-striatal cognitive dysfunction, psychiatric disturbance, and profound motor impairment. Clinical neuropsychologists are central to early recognition, differential diagnosis, and ongoing care,

working closely with patients, families, and multidisciplinary teams. Assessment and intervention must be bespoke to each individual, balancing the evolving profile of cognitive, behavioural, and motor challenges within the unique context of each patient and family.