# NEUROPSYCHOLOGY TODAY

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*September 2009 Issue – Adult Neuropsychology: Dementia*

## Dementia

With the increase in life expectancy in the developed countries, dementia, a disabling neurological condition, has become very much prevalent among older individuals. The awareness about dementia and research focusing on its treatment and prevention have rapidly grown in the past years. Dementia is not part of normal aging, but a neurological condition secondary to a number of disorders that affect brain integrity, such as Alzheimer's disease, Huntington's disease, dementia with Lewy bodies, and fronto-temporal dementia. Dementia can also develop secondary to metabolic disorders, brain tumors, brain injury, infections, poisoning, anoxia or hypoxia, and other conditions.[1,2]

Significant overlap exists between different types of dementia, which are associated with common neuropathologies. Some patients present with unique features of dementia and many others demonstrate a mixed set of symptoms characteristic of more than one type of dementia. An interaction between genetic, neurochemical, and environmental

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## *Inside:*



## Neuropsychology of Dementia

Most research studies focus on dementia in Alzheimer's disease (AD), the most common cause of dementia in older adults. Neuropsychological testing is critical in detecting early signs of AD dementia due to the lack of a reliable biological marker that can distinguish AD dementia from normal aging or from other neurodegenerative disorders. Neuropsychological findings have helped in improving differential diagnosis and identifying the underlying neurological changes that are reflected in cognitive symptoms.[3]

Dementia in AD, referred to as "cortical dementia" is characterized by a progressive decline in a range of functions, including language, abstract reasoning, executive functions, attention, visuospatial

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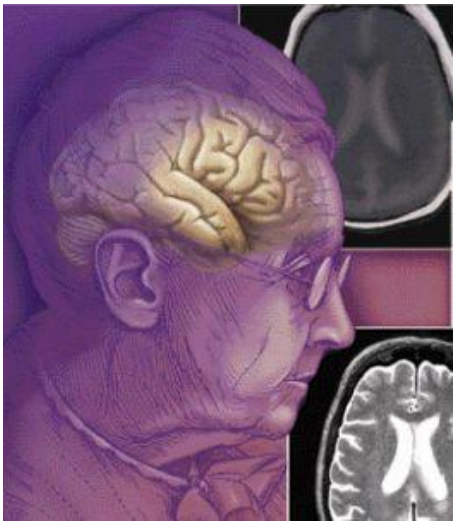


## Prevention of Dementia

To date, no treatments that can cure or reverse brain damage caused by neuropathological conditions are available. Treatments typically address the symptoms, rather than causes of dementia. However, several factors are believed to help prevent or slow the progression of dementia. For example, it is known that high hypertension is contributory to strokes, white matter lesions, neurofibrilliary tangles, and amyloid plaques, all of which can affect cognition. Thus, maintaining normal blood pressure in midlife may lower the risk of cognitive symptoms in later life.[4]

Healthy diet and lifestyle may also lower the risk of dementia. Diet rich with fruits, vegetables and fish, moderate alcohol consumption, regular exercise and healthy weight, and no smoking are all factors that may prevent or delay the onset of dementia.[4]

Finally, education has been linked to lower risk of dementia. People with higher level of education tend to stay employed longer and to be cognitively active, thus exercising their brain functions. At the same time, educated individuals are likely to develop strategies to compensate for their cognitive deficits. Based on these findings, interventions that incorporate cognitive exercises and compensatory strategies have been developed for patients with early dementia.[4]

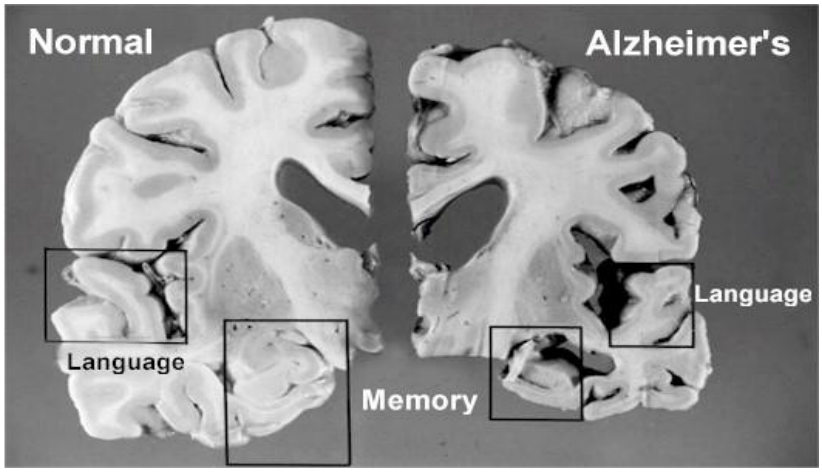
the type of comorbid condition is considered to be at the root of dementias. As an example, vascular pathology has been found to be characteristic of most cases of dementia, suggesting that early diagnosis and treatment of vascular conditions can modulate the onset of dementia.[1,2]

It is estimated that among individuals 65 years of age, the prevalence of dementias is approximately 1.5%. This rate doubles every 4 years, reaching 30% at 80 years. The incidence of dementia is low in men and in individuals of African or Asian origin. Patients with dementia have a significantly shortened life expectancy, which is estimated at around 8 years from diagnosis.[1]

The most common and the most extensively studied dementia is associated with Alzheimer's disease. In Alzheimer's disease, amyloid plaques and neurofibrillary tangles form in the brain, increasing in number with time and resulting in progressive cognitive and neuropsychiatric symptoms (see image on the right).[2]

Vascular dementia is the second most common cause of dementia. It results from brain damage induced by cerebrovascular or cardiovascular problems, such as strokes. Unlike those in Alzheimer's disease, the symptoms of vascular dementia usually begin suddenly, frequently after stroke. Vascular dementia is not necessarily progressive and may or may not improve with time. Serial neuropsychological exams can determine whether cognitive impairment is progressing.[2]

Patients are diagnosed with dementia when two or more of their cognitive functions are significantly impaired. Cognitive symptoms that are not severe enough to be classified as dementia are referred to as mild cognitive impairment.[2]




*The image above demonstrates a healthy brain (left) vs. brain with damage caused by Alzheimer's disease (right).*

## Quality of Life in Patients with Dementia

Quality of life (QoL) is a general term that refers to the person's socioemotional and physical well-being. It is not surprising that people with chronic conditions such as dementias exhibit lower levels of QoL compared to their healthy counterparts. However, research shows that in demented individuals, QoL is mediated by a number of socio-demographic and clinical factors. For instance, older age at onset and higher caregiver burden are associated with better QoL outcomes. Additionally, comorbid behavioral disorder, depression, and possibly activity limitation have a negative impact on QoL.[5]

With regard to cognition, it has been demonstrated that improvement in cognitive functioning is associated with improved QoL in individuals with dementia. Thus, interventions aimed at alleviating neurocognitive impairment are likely to lead to an improvement in the patients' overall well-being, which highlights the importance of timely and targeted treatment of cognitive deficits[5] (see "Non-Biological Interventions in Dementia" on p.3).

### About Dr. Rimma Danov

Dr. Rimma Danov received her PhD in clinical psychology from Adelphi University in NY. She completed her internship in clinical psychology and neuropsychology at Harvard Medical School and postdoctoral fellowship in pediatric and adult neuropsychology in a private clinic affiliated with NJ Medical School and the Robert Wood Johnson Medical Center. She is an assistant clinical professor at Penn State University, Dept. of Kinesiology, and has served as an assistant clinical professor at NYU School of Medicine, Dept. of Neurology, and Adelphi University, Derner Institute. In the past, she worked as a neuropsychologist for the NJ Devils Hockey Team and was engaged as a co-investigator of TBI in boxers at the NYS Athletic Commission.

Presently, Dr. Danov maintains a full-time private neuropsychology practice where she examines neurocognitive and neurobehavioral functioning of patients 2-90 years of age with various neurological and neuropsychiatric disorders, such as MS, TBI, CVA, Parkinson's, Alzheimer's, dementia, ADHD, PDD, Autism, learning disabilities, seizures, and many others, using state-of-the-art neuropsychological techniques. Dr.Danov also conducts and publishes research in these areas. She is available for medico-legal consultations and testimony.

*("Neuropsychology of Dementia," continued from p.1)*

abilities, and particularly episodic memory, as many patients develop prominent amnesia (see image below). On the other hand, Huntington's disease is associated with "subcortical dementia" described as slow thinking, poor learning and attention, visuoperceptual deficits, and behavioral changes (i.e. apathy and depression).[3]

Cognitive symptoms of dementia with Lewy bodies is very similar to those found in AD, with additional motor features of parkinsonism, visual hallucinations, and fluctuating attention and alertness, and more severe visuospatial, executive, and attentional deficits. With regard to frontotemporal dementia, this disease typically begins with personality and behavioral changes, such as inappropriate social behavior, apathy, loss of insight, hyperorality, decreased speech, etc. that precede or are accompanied by deficits in executive, attentional, language, memory, and visuospatial functions.[3]

Finally, cognitive decline associated with vascular dementia can be fluctuating, stepwise, or abrupt. Compared to individuals with AD, patients with vascular dementia are more impaired on tests of executive functions and less impaired on measures of episodic memory.[3]

Neuropsychological exam provides objective detailed profile of specific cognitive deficits, the severity and the course of cognitive impairment, and the rate of its progression. The results are useful for diagnosing dementia in its early stages and also during differential diagnosis.[1,3]

## Non-Biological Interventions in Dementias

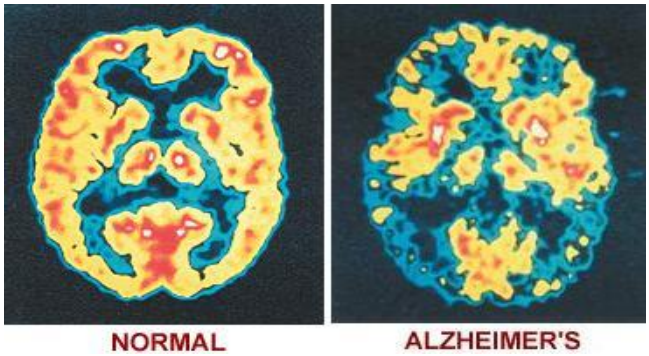
As stated earlier, dementias are associated with cognitive symptoms that are chronic and progressive, which should be addressed by both biological and non-biological approaches. Non-biological approaches may range from counseling and therapy, to support system for caregivers, to cognitive training.[6]

Originally developed for patients following traumatic brain injury and stroke, cognitive rehabilitation (CR) is increasingly utilized in other populations, including patients with dementia. The goal of CR is to enhance individuals' functioning in everyday context through the use of consistent exercises aiming to either improve or compensate for the diminished cognitive functions.[6]

Two types of CR are typically employed in patients with dementia. Group CR involves reality orientation training, music/ art therapy, reminiscence therapy, validation therapy, and daycare services. Individualized CR is a tailored neurocognitive program usually developed and utilized for patients at early disease stages.[6]

Research showing that cognitively stimulating activities are associated with lower risk of dementia led to the development of individualized cognition-based approaches in mild dementia. The underlying assumption of CR is that practice may improve, or at least maintain, specific cognitive functions resulting in enhanced daily functioning and quality of life.[6]

Memory is most frequently the focus of CR. Tasks vary in difficulty levels and can be in paper-and-pencil or computerized form, auditory, or analogous to activities of daily living. Thus far, research has supported the effectiveness of such techniques as spaced retrieval, dual cognitive support, and procedural memory training.[6]




*PET scan above shows lower brain activation (indicated by blue and black areas) in a patient with Alzheimer's disease.*

**Works cited:**

1. Ritchie & Lovestone (2002). The dementias. Lancet, 360: 1759-66.
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**Image credits:**

1. Background image (pp.1,4): Jeff Johnson Biolog. & Medic. Visuals
2. Dementia image (p.1): Healthscape.co.uk
3. Alzeimer's disease (p.2): umsl. edu/ ~homecare/dementia.htm
4. PET scan (p.3): niapublications.org

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**Next Issues:** Oct'09: ADHD; Nov'09:Alcoholic Encephalopathy

## We take the following insurance plans:

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|---|---|
| Aetna | HIP |
| Magnacare | Amerigroup |
| Medicare | 1199 |
| BCBS | MHN |
| Cigna | Multiplan |
| Elderplan | No-Fault |
| Fidelis | Tricare |
| First Health | UHC/Oxford |
| HealthNet | Workers' Comp |
| Health Plus | |

Case dependent:

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| GHI HMO | Atlantis |
| Health First | Americhoice |

Each insurance carrier determines the medical necessity of every requested neuropsychological exam differently. Our billing staff determines whether the exam will be covered by the insurance before the exam begins and works very hard to obtain an authorization, if needed. If you have questions about a plan that is not listed here, contact our office to find out whether we can obtain an authorization or have recently joined that plan.

## Languages

We are open to diverse cultures in this practice and value the quality of a bilingual neuropsychological exam performed in the patient's native language. Dr. Danov is a native Russian speaker. Her current clinical staff include native ***Russian***, ***Spanish*** and ***Hebrew*** speakers.



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