



Med Uni  
Graz

*Pioneering Minds*

# NEW TECHNOLOGIES IN DEMENTIA THERAPY

Assoc. Prof. PD Mag. Dr. Marisa Koini

Department of Neurology

Division of Neurogeriatrics

BioNanoNet Gold Member Webinar „Leveraging New  
Technologies for Societal Impact“, June 27th 2023



# Dementia - Key Facts

- World-wide prevalence: 55 million, incidence 10 million
- (Modifiable) Risk factors: age (more common in those 65 or older), high blood pressure (hypertension), high blood sugar (diabetes), being overweight or obese, smoking, drinking too much alcohol, being physically inactive, being socially isolated, depression
- **A major cause of disability and dependency among older people**

## Common **forms** are:

- Alzheimer's disease (60-70%)
- Vascular dementia
- Lewy body dementia
- Fronto-temporal dementia
- After stroke, infection (e.g. HIV)

## **Therapy:**

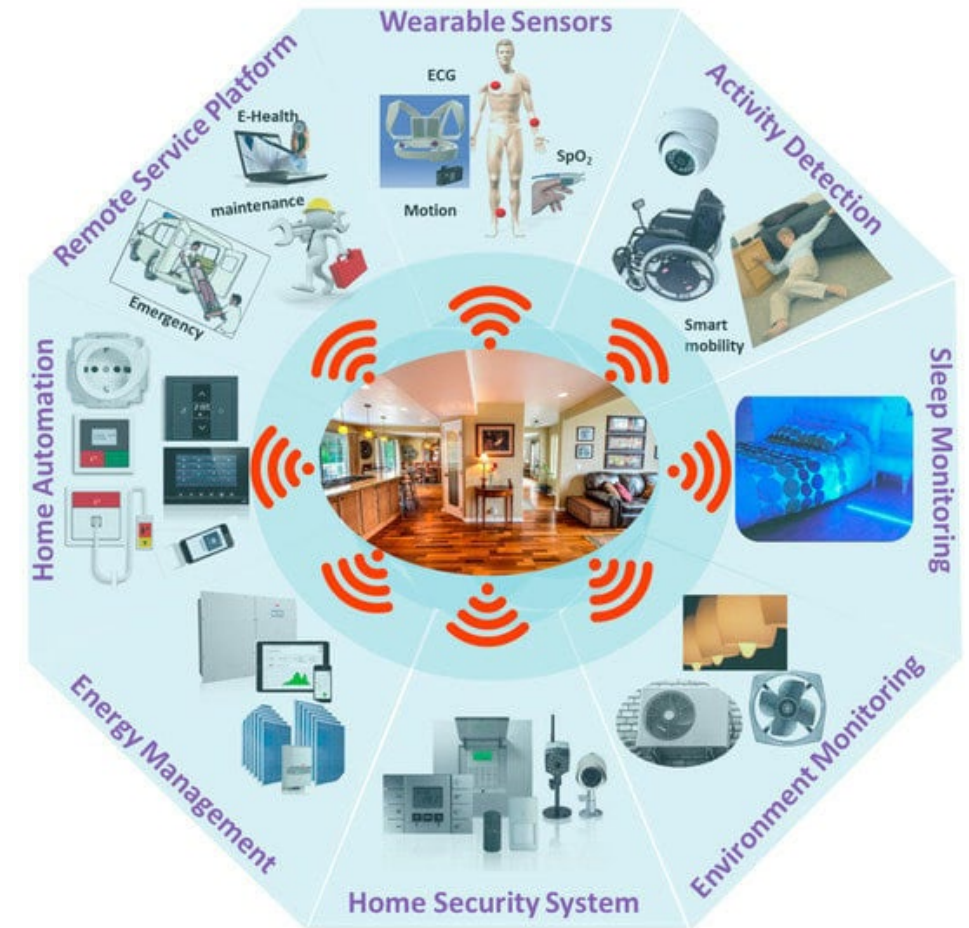
- incurable

## Early **signs and symptoms** are:

- forgetting things or recent events
- losing or misplacing things
- getting lost when walking or driving
- being confused, even in familiar places
- losing track of time
- difficulties solving problems or making decisions
- problems following conversations or trouble finding words
- difficulties performing familiar tasks
- misjudging distances to objects visually.

# Technologies in dementia

- ▶ manage lifestyle, monitor cognitive performance, ensure security and safety of the elderly, deliver rehabilitation services
- ▶ Wearables/Biosensors to monitor health and collect data (e.g. smart watch), smart homes, home based robots



## The MultimodAAL Study

Playful multimodal intervention, monitoring and decision support for activation of people with Alzheimer's dementia



## Aim

Examining the efficacy of a tablet-based training intervention over 6-months compared to a unsupervised paper-pencil training in patients with mild Alzheimer's disease to delay cognitive decline



**multimodAAL**



HealthSystemIntelligence



The MultimodAAL Study



Intervention  
group

# Primary outcome

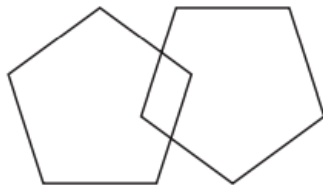
## The Mini Mental State Exam



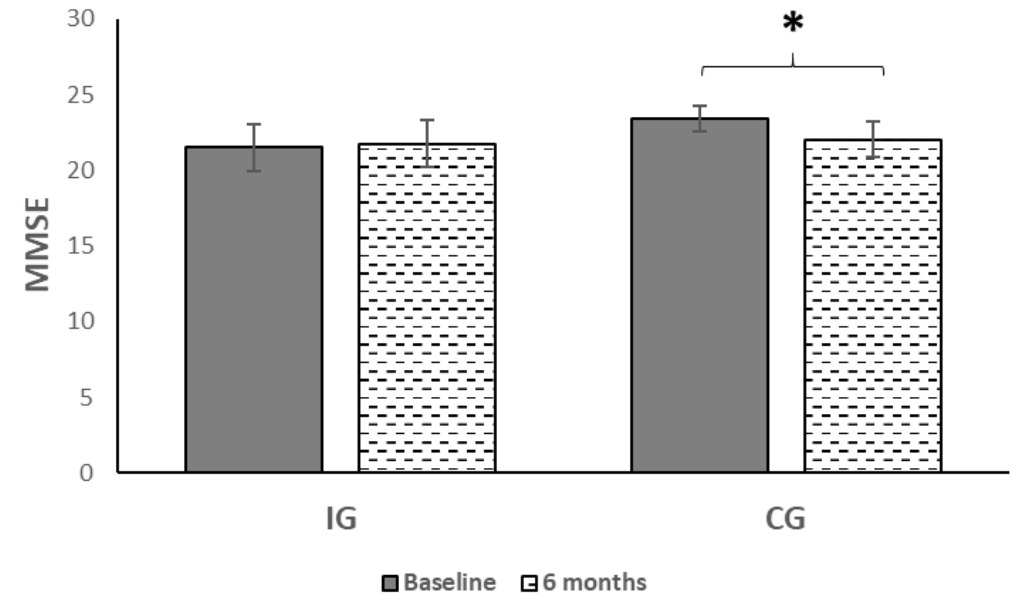
Med Uni  
Graz



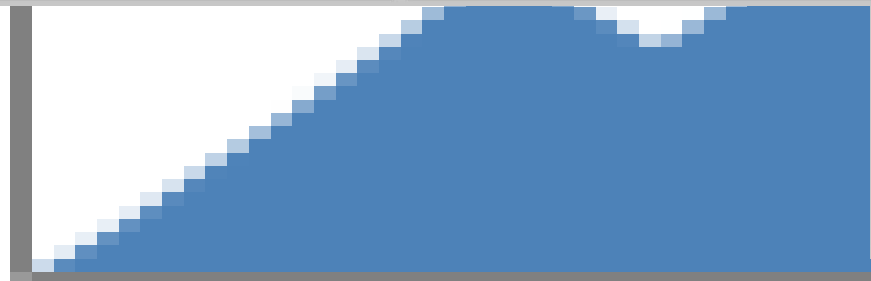
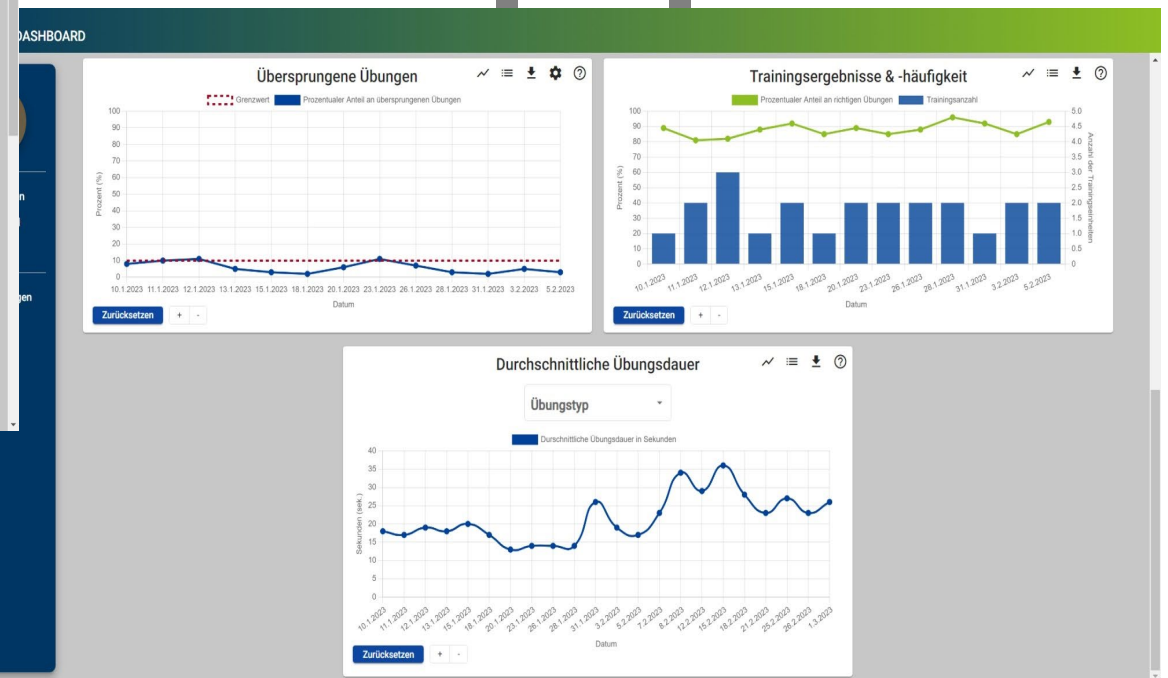
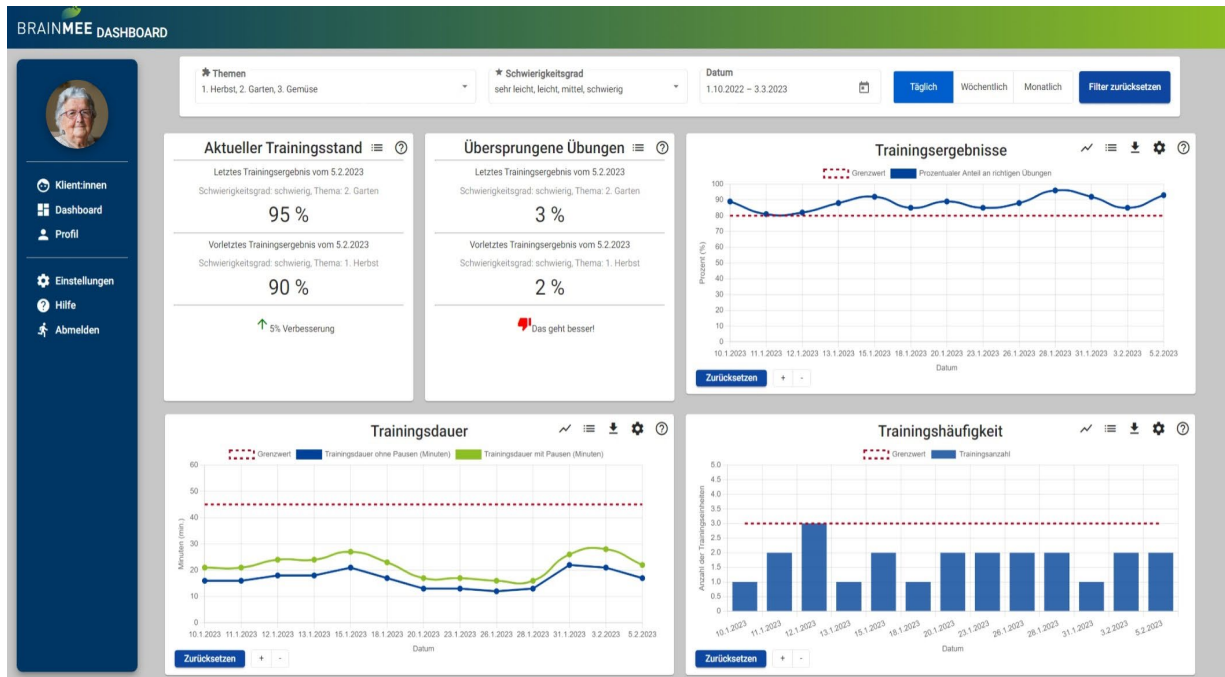
Maximum	Score	
5	( )	<b>Orientation</b>
5	( )	What is the (year) (season) (date) (day) (month)?
	( )	Where are we (state) (country) (town) (hospital) (floor)?
3	( )	<b>Registration</b>
		Name 3 objects: 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he/she learns all 3. Count trials and record. Trials _____
5	( )	<b>Attention and Calculation</b>
		Serial 7's. 1 point for each correct answer. Stop after 5 answers. Alternatively spell "world" backward.
3	( )	<b>Recall</b>
		Ask for the 3 objects repeated above. Give 1 point for each correct answer.
2	( )	<b>Language</b>
1	( )	Name a pencil and watch.
1	( )	Repeat the following "No ifs, ands, or buts"
3	( )	Follow a 3-stage command:
		"Take a paper in your hand, fold it in half, and put it on the floor."
1	( )	Read and obey the following: CLOSE YOUR EYES
1	( )	Write a sentence.
1	( )	Copy the design shown.



Total Score



# BrainMee Dashboard



# Virtual Reality



# Virtual Reality



# Contact

Assoc. Prof. Mag. Dr. Marisa Koini

Department of Neurology, Division of Neurogeriatrics

Augenbruggerplatz 22, 80110 Graz

+43 316 385 16537

[marisa.koini@medunigraz.at](mailto:marisa.koini@medunigraz.at)

<https://neurogeriatrie.medunigraz.at/forschung/neuropsychologie>



Medizinische  
Universität  
Graz