



GMN Case Presentation

Albany Memory Assessment Clinic

August 19, 2022



Case 1

- ▶ 67 yo Caucasian male
- ▶ 20 yrs of education
- ▶ Works full time as campus dean at MCG College
 - ▶ Former MD
- ▶ Lives at home with wife of 38 yrs, has two children
- ▶ Complains of forgetting names more over the last 1-2 yrs
- ▶ Independent of basic ADLs
- ▶ Still drives, denies any problems
- ▶ No falls, ambulatory assistance, or changes in balance
- ▶ Appetite normal, no significant weight gain or loss
- ▶ Denies any problems sleeping

Medical History

Problem List

- ▶ Hypertension
- ▶ Hyperlipidemia
- ▶ Pre-Diabetes

Medications

- ▶ Amlodipine 5 mg QD
- ▶ Valsartan 80 mg QD

Additional History

- ▶ Head trauma
 - ▶ Concussion in 1983, no problems since
- ▶ No family hx of Alzheimer's
- ▶ No hx of alcohol or drug abuse
- ▶ No hx of tobacco use

SUMMARY OF NEUROCOGNITIVE SCREENING

MAY 2022

Age	Education	Handedness
67	20	Right

Orientation

MoCA
Clock Drawing Task

RAW	%ile
29	91
13	99

Global Cognition

Fluid Composite
Crystallized Composite
Total Composite

Age Corrected SS	Age Adjusted %ile
97	42
131	98
116	86

Language

Picture Vocabulary
Oral Reading Recognition

Age Corrected SS	Age Adjusted %ile
116	86
141	99

Raw

COWA (FAS)
Animal Fluency
MoCA Naming

Raw	%ile
44	45
22	58
3	69

Working Memory

List Sorting

Age Corrected SS	Age Adjusted %ile
125	95

Episodic Memory

Picture Sequence Memory

Age Corrected SS	Age Adjusted %ile
104	60

Raw

Rey AVLT Learning
Rey AVLT Delayed Memory
Rey AVLT Recognition Hits
Rey AVLT Recognition/Discrim.

Raw	Percentile
45	58
13	92
15	
15	87

Rey AVLT Recognition FP

Raw
0

Executive Function

Flanker Inhibitory Task
Dimensional Card Sort

Age Corrected SS	Age Adjusted %ile
85	16
105	63

Processing Speed

Pattern Comparison

Age Corrected SS	Age Adjusted %ile
72	3

Raw

PHQ-9

0

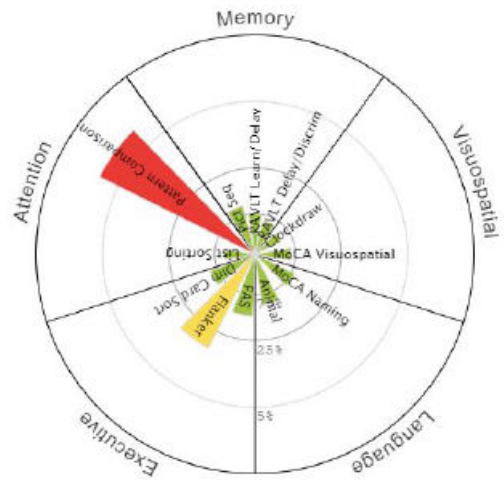
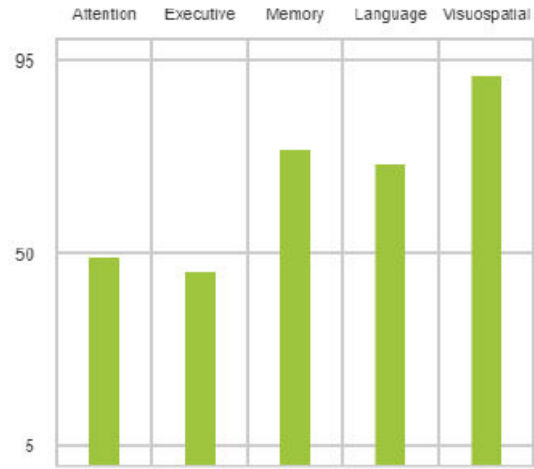
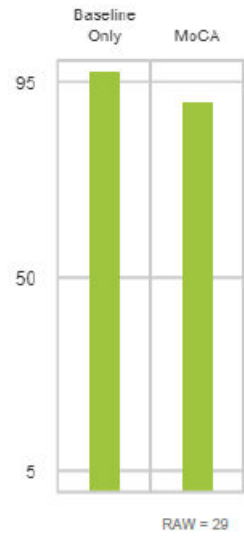
Raw

GAD-7

0

Neuropsych Testing Results

SUMMARY OF NEUROCOGNITIVE SCREENING

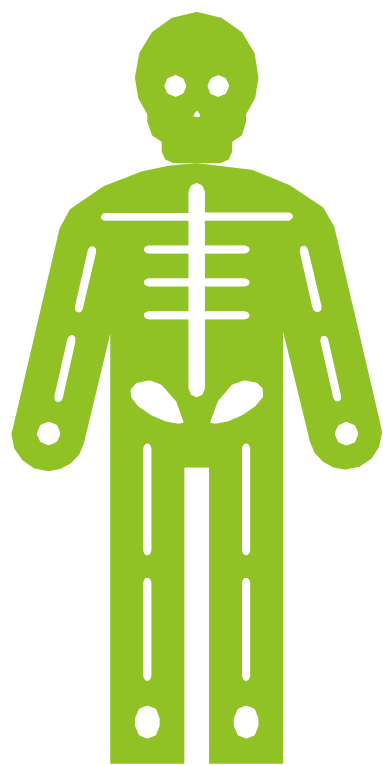


Neuropsych Testing Results

Lab and Screening Results

- ▶ RPR - nonreactive
- ▶ Vitamin B12 - 338
- ▶ TSH - 2.09

- ▶ PHQ-9 ~ 0
- ▶ GAD7 ~ 0



See MRI
Scans

MRI Review

- ▶ Some cortical atrophy of the medial occipital lobes
 - ▶ Right greater than left
- ▶ Disproportion of lateral ventricles
- ▶ Mild white matter flair hyperintensities

Differential Diagnosis

- ▶ MCI
- ▶ Early Alzheimer's
- ▶ Vascular disease

Diagnosis

- ▶ Age related memory disorder
 - ▶ Recommend Mediterranean diet
 - ▶ Increase brain healthy activities and exercise
 - ▶ Repeat testing in 1 year

Case 2

- ▶ 72 yo African American female
- ▶ 10th grade education
- ▶ Has five children
- ▶ Lives at home alone
 - ▶ Granddaughter is in and out of the house
- ▶ Retired from Merck in 2002
- ▶ Memory problems started 5 yrs ago
- ▶ Trouble with STM, recall and processing thoughts
- ▶ Misplacing things
- ▶ Drives alone
 - ▶ Has forgotten where she was going twice and had to pull over
- ▶ Cooks with no trouble
 - ▶ Does notice she has to double check if the stove is off
- ▶ Manages own finances
 - ▶ Has forgotten bills until someone has called her
- ▶ Prepares own medications
 - ▶ Has forgotten those occasionally
- ▶ Two falls in the last six months
 - ▶ Has a cane but doesn't like to use it

Medical History

Problem List

- ▶ Hyperthyroidism
- ▶ DM Type II
- ▶ Mixed anxiety and depression
- ▶ Sleep apnea
- ▶ Hypertension
- ▶ COPD
- ▶ Fibrosis of lung
- ▶ GERD
- ▶ Cervical radiculopathy
- ▶ Mixed urinary incontinence

Medications

- ▶ Atorvastatin 80 mg qd
- ▶ Benzonatate 100 mg q8h prn
- ▶ Diclofenac 75 mg BID prn
- ▶ Diltiazem CD 300 mg qd
- ▶ Hyoscyamine 0.125 mg tid
- ▶ Metformin 1000 mg qd
- ▶ Omeprazole 20 mg qd
- ▶ Sertraline 50 mg qd
- ▶ Tizanidine 4 mg prn
- ▶ Valsartan-HCTZ 320-25 mg qd

Additional History

- ▶ No family hx of Alzheimer's
- ▶ Hx of head trauma
 - ▶ Fall down a flight of stairs
 - ▶ MVA
- ▶ Denies alcohol, tobacco, or drug use

SUMMARY OF NEUROCOGNITIVE SCREENING

Age	Education	Handedness
72	10	Right

Orientation

RAW	%ile
25	42
13	94

MoCA
Clock Drawing Task

Global Cognition

Age Corrected SS	Age Adjusted %ile
64	1
68	2
61	1

Fluid Composite
Crystallized Composite
Total Composite

Language

Age Corrected SS	Age Adjusted %ile
75	4
68	2

Picture Vocabulary
Oral Reading Recognition

Raw

Raw	%ile
18	23
10	18
2	12

COWA (FAS)
Animal Fluency
McCA Naming

Working Memory

Age Corrected SS	Age Adjusted %ile
88	20

List Sorting

Episodic Memory

Age Corrected SS	Age Adjusted %ile
94	34

Picture Sequence Memory

Raw

Raw	Percentile
34	33
6	33
13	
11	6

Rey AVLT Learning
Rey AVLT Delayed Memory
Rey AVLT Recognition Hits
Rey AVLT Recognition/Discrim

Rey AVLT Recognition FP

Raw
2

Executive Function

Age Corrected SS	Age Adjusted %ile
68	2
75	5

Flanker Inhibitory Task
Dimensional Card Sort

Processing Speed

Age Corrected SS	Age Adjusted %ile
54	1

Pattern Comparison

Raw

15

PMQ-9

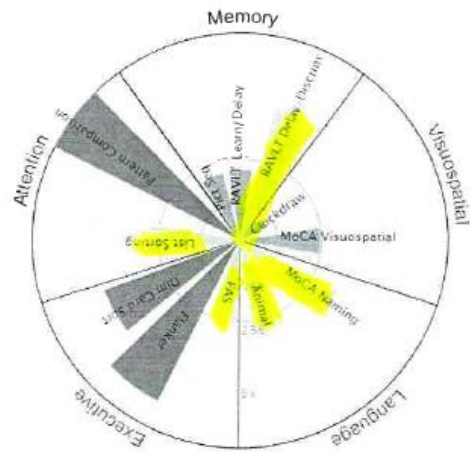
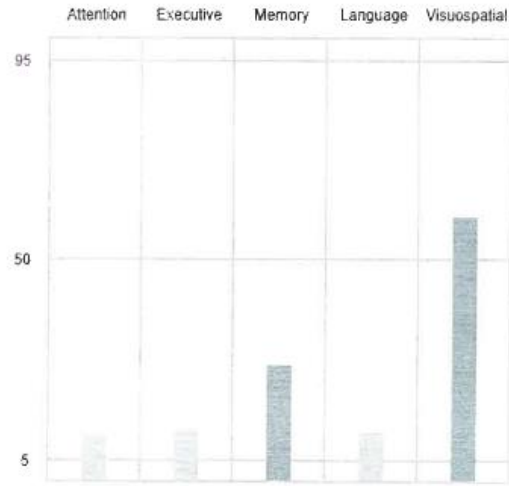
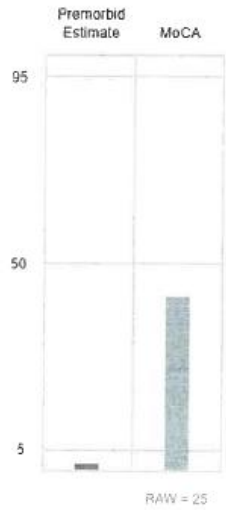
Raw

3

QAD-7

Neuropsych Testing Results

SUMMARY OF NEUROCOGNITIVE SCREENING (continued)

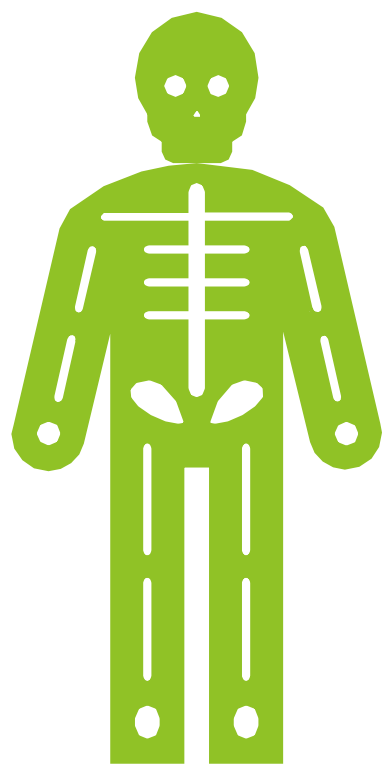


Neuropsych Testing Results

Lab and Screening Results

- ▶ RPR - nonreactive
- ▶ Vitamin B12 - 891
- ▶ TSH - 2.30
- ▶ Lyme Total Antibody - Negative

- ▶ PHQ-9 ~ 15
- ▶ GAD7 ~ 3



See MRI
Scans

MRI Review

- ▶ Mild cerebral atrophy
- ▶ Nonspecific periventricular and deep white matter T2 hyperintensities
- ▶ No acute infarct

Differential Diagnosis

- ▶ Anxiety/depression
- ▶ MCI
- ▶ Alzheimer's

LP Results

- ▶ A-beta 42
 - ▶ 869.6
- ▶ T- Tau
 - ▶ 153.1
- ▶ P-Tau
 - ▶ 37.3
- ▶ ATI
 - ▶ 2.07
- ▶ Not consistent with Alzheimer's

Diagnosis

- ▶ Mild cognitive impairment
 - ▶ Recommend Donepezil 5 mg qd
 - ▶ Recommend Mediterranean diet
 - ▶ Recommend increased exercise and brain healthy activities
 - ▶ Recommend a routine daily schedule
 - ▶ Recommend Sertraline 50 mg
 - ▶ Recommend follow up 9 months - 1 year if symptoms progress

Case 2b

- ▶ 74 yo African American female
- ▶ 10th grade education
- ▶ Lives alone
- ▶ Notices mild memory changes since last seen in 2020
- ▶ Admits to feeling lonely and states she is not happy
- ▶ Forgetting names, difficulty processing thoughts, and mis placing things
- ▶ Denies repetition
- ▶ Reports “falling over” and unsteady balance
 - ▶ 2 falls within the last 6 months
 - ▶ Uses a cane or walker as needed
- ▶ Independent of basic ADLs
- ▶ Still drives and with no problems
- ▶ Takes medicine out of individual bottles
 - ▶ Has forgotten them occasionally
- ▶ Manages finances
 - ▶ Sometimes has to be reminded to pay a bill
- ▶ Still cooks
 - ▶ Recently burned potatoes as she forgot they were on the stove
- ▶ Reports a 10lb weight loss in the last 3-4 months
- ▶ Reports waking up several times throughout the night to use the restroom

Medical History

Problem List

- ▶ Diabetes
- ▶ Hyperlipidemia
- ▶ Morbid Obesity
- ▶ Hypertension
- ▶ Sleep Apnea - On CPAP
- ▶ Congestive Heart Failure
- ▶ Asthma
- ▶ GERD
- ▶ Glaucoma
 - ▶ Blind in left eye

Medication List

- ▶ Metformin ER 500 2 tabs BID
- ▶ Metoprolol Succinate ER 25 mg QD
- ▶ Singulair 10mg QD
- ▶ Simvastatin 40 mg QD
- ▶ Symbicort 160mg-4.5mcg 2 puffs BID

Additional History

- ▶ Family hx of Alzheimer's
 - ▶ Father
 - ▶ Paternal niece
- ▶ Denies alcohol, tobacco, or drug use
- ▶ Gallbladder removed 3/2021

SUMMARY OF NEUROCOGNITIVE SCREENING

JULY 2022

Age	Education	Handedness
74	10	Right

Orientation

	RAW	%ile
MoCA	25	42
Clock Drawing Task	13	94

Global Cognition

	Age Corrected SS	Age Adjusted %ile
Fluid Composite	61	1
Crystallized Composite	71	3
Total Composite	60	1

Language

	Age Corrected SS	Age Adjusted %ile
Picture Vocabulary	84	14
Oral Reading Recognition	64	1

	Raw	%ile
COWA (FAS)	17	13
Animal Fluency	17	86
MoCA Naming	3	69

Working Memory

	Age Corrected SS	Age Adjusted %ile
List Sorting	82	11

Episodic Memory

	Age Corrected SS	Age Adjusted %ile
Picture Sequence Memory	75	5

	Raw	Percentile
Rey AVLT Learning	29	13
Rey AVLT Delayed Memory	3	5
Rey AVLT Recognition Hits	13	
Rey AVLT Recognition/Discrim.	8	1

Rey AVLT Recognition FP

Raw
5

Executive Function

	Age Corrected SS	Age Adjusted %ile
Flanker Inhibitory Task	68	2
Dimensional Card Sort	75	5

Processing Speed

	Age Corrected SS	Age Adjusted %ile
Pattern Comparison	68	2

Raw
22

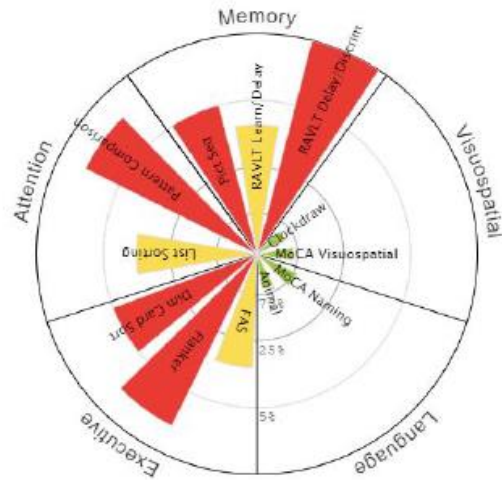
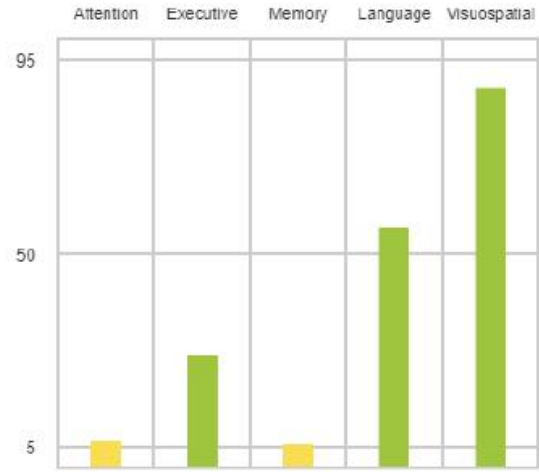
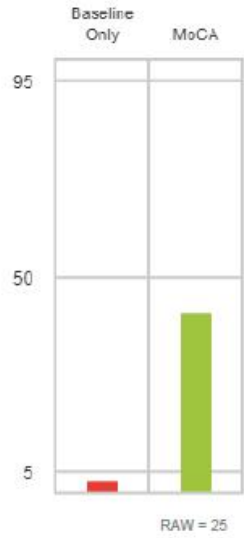
PHQ-9

Raw
10

GAD-7

Neuropsych Testing Results

SUMMARY OF NEUROCOGNITIVE SCREENING

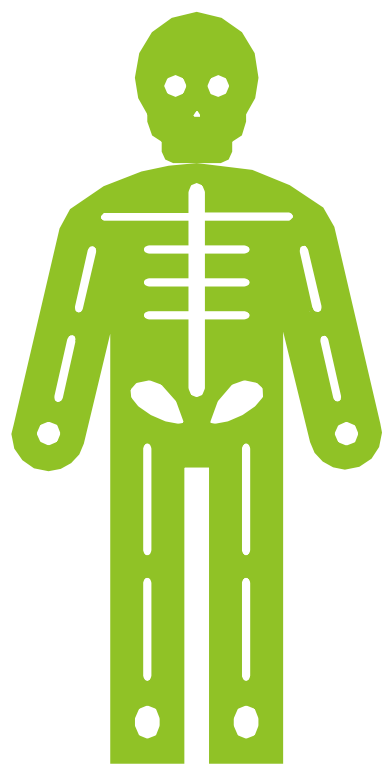


Neuropsych Testing Results

Lab and Screening Results

- ▶ RPR - nonreactive
- ▶ Vitamin B12 - 1968
- ▶ TSH - 2.370

- ▶ PHQ-9 ~ 22
- ▶ GAD7 ~ 10



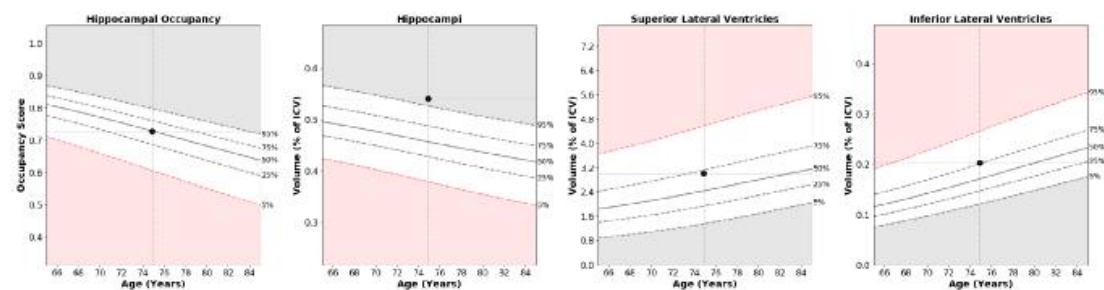
See MRI
Scans

MORPHOMETRY RESULTS



Brain Structure	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Hippocampal Occupancy Score (HOC)	0.73	N/A	49
Hippocampi	6.81	0.54 (0.38 - 0.53)	97
Superior Lateral Ventricles	38.09	3.03 (1.36 - 4.58)	72
Inferior Lateral Ventricles	2.56	0.20 (0.12 - 0.27)	76

AGE AND SEX MATCHED REFERENCE CHARTS



*The Hippocampal Occupancy Score is defined as $\left(\frac{\text{Left Hippocampal Volume}}{\text{Left Hippocampal Volume} + \text{Left ILV Volume}} \right) + \left(\frac{\text{Right Hippocampal Volume}}{\text{Right Hippocampal Volume} + \text{Right ILV Volume}} \right) / 2.0$

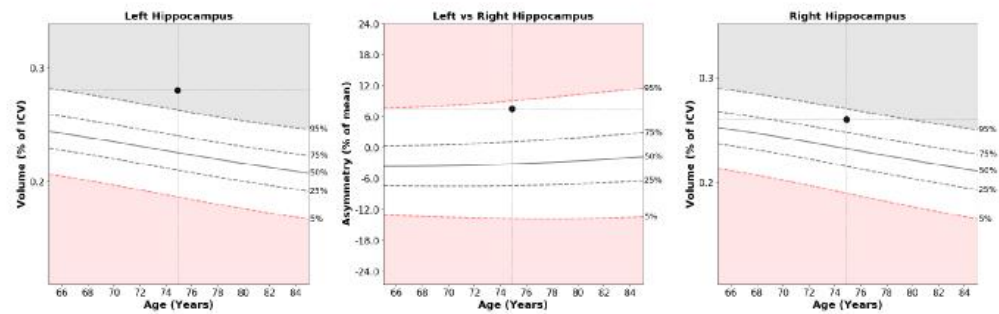
NeuroQuant Readings

MORPHOMETRY RESULTS



Hippocampus	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Left	3.53	0.28 (0.19 - 0.26)	99
Right	3.28	0.26 (0.19 - 0.27)	89
Left-Right Asymmetry Index*: 7.5			93

AGE AND SEX MATCHED REFERENCE CHARTS



*The Asymmetry Index is defined as the percentage difference between left and right volumes divided by their mean.

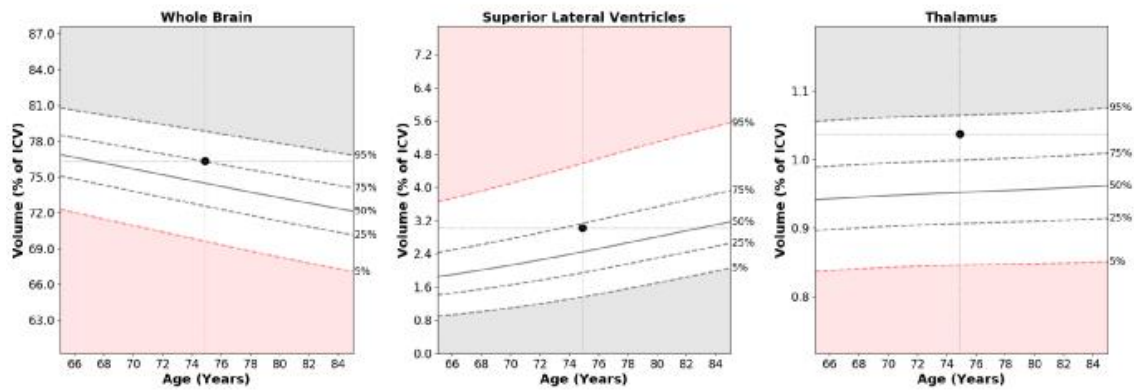
NeuroQuant Readings

MORPHOMETRY RESULTS (1 of 2)



Brain Structure	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Whole Brain	961.03	76.35 (69.61 - 78.83)	76
Superior Lateral Ventricles	38.09	3.03 (1.36 - 4.58)	72
Thalamus	13.06	1.04 (0.85 - 1.06)	89

AGE AND SEX MATCHED REFERENCE CHARTS



NeuroQuant Readings

MRI Review

- ▶ Mild-to-moderate diffuse cerebral volume loss
- ▶ Subcortical white matter FLAIR and T2 hyperintensity identified in the cerebral hemispheres bilaterally
- ▶ Bilateral hippocampus within normal range and lateral ventricles within normal range

Differential Diagnosis

- ▶ MCI
- ▶ Lewy body
- ▶ Depression/anxiety

Diagnosis



Case 3

- ▶ 64 yo Caucasian male
- ▶ 16 years of education
- ▶ Married 30 years, has one son
- ▶ Former IT director, retired in 2013
- ▶ Memory changes in the last 5 yrs but has worsened in the last 3
- ▶ Misplacing things
- ▶ More repetitious per wife
- ▶ Denies forgetting names or difficulty processing thoughts
- ▶ Forgets appointments, misplacing things.
- ▶ Very little cooking, but does so with no problems
- ▶ One instance of paranoia 18 months ago
 - ▶ Accused wife of cutting cell service off
- ▶ Independent of basic ADLs
- ▶ Still drives but is limited
 - ▶ Car accident in March 2022, pt states due to wife yelling at him
- ▶ Wife manages finances but has always done so
- ▶ Wife places medication into weekly pill box
- ▶ No falls, no ambulatory assistance, or change in balance
- ▶ Appetite normal, no significant weight loss or gain
- ▶ Denies any problems sleeping

Medical History

Problem List

- ▶ Hypertension
- ▶ Depression
- ▶ Sleep Apnea
 - ▶ CPAP used nightly
- ▶ Hyperlipidemia
- ▶ MCI
 - ▶ Dx 3 yrs ago

Medications

- ▶ Zetia 10 mg QD
- ▶ Valsartan 320 mg QD
- ▶ Omeprazole 20 mg QD
- ▶ Bupropion ER 150 mg 2 tabs in AM, 1 tab in PM
- ▶ Donepezil 10 mg QD
- ▶ Amlodipine 5 mg QD
- ▶ Other OTC vitamins and supplements

Additional History

- ▶ No Family hx of Alzheimer's
- ▶ No known head trauma
- ▶ No hx of alcohol or drug abuse
- ▶ Former smoker
 - ▶ Quit smoking in 1987

SUMMARY OF NEUROCOGNITIVE SCREENING

MAY 2022

Age	Education	Handedness
64	16	Right

Orientation

RAW	%ile
22	8
12	95

MoCA
Clock Drawing Task

Global Cognition

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED
NOT REPORTED	NOT REPORTED
NOT REPORTED	NOT REPORTED

Fluid Composite
Crystallized Composite
Total Composite

Language

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED
NOT REPORTED	NOT REPORTED

Picture Vocabulary
Oral Reading Recognition

Raw	%ile
39	37
12	3
3	69

COWA (FAS)
Animal Fluency
MoCA Naming

Working Memory

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED

List Sorting

Episodic Memory

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED

Picture Sequence Memory

Raw	Percentile
24	1
1	1
12	
8	1

Rey AVLT Learning
Rey AVLT Delayed Memory
Rey AVLT Recognition Hits
Rey AVLT Recognition/Discrim.

Rey AVLT Recognition FP

Raw
4

Executive Function

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED
NOT REPORTED	NOT REPORTED

Flanker Inhibitory Task
Dimensional Card Sort

Processing Speed

Age Corrected SS	Age Adjusted %ile
NOT REPORTED	NOT REPORTED

Pattern Comparison

Raw
2

PHQ-9

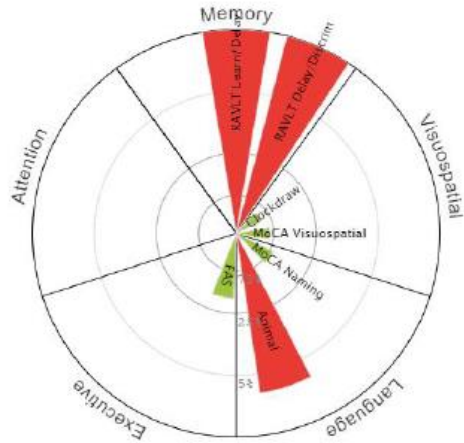
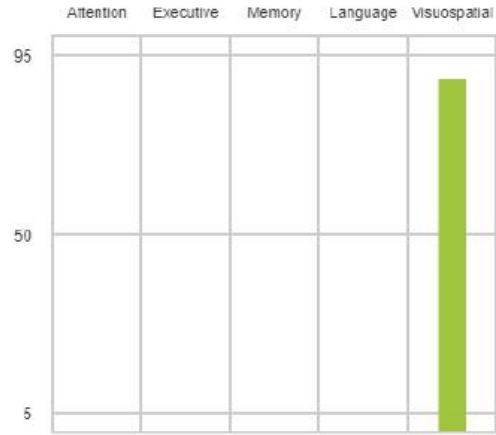
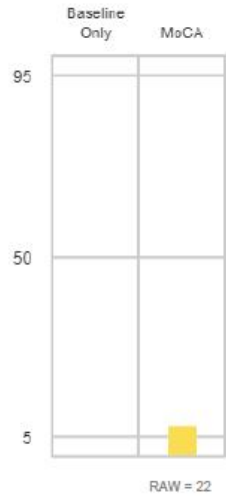
Raw
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GAD-7

Neuropsych Testing Results

SUMMARY OF NEUROCOGNITIVE SCREENING

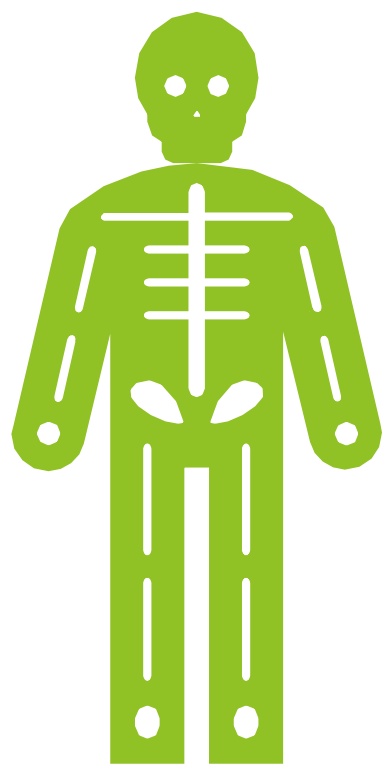
Neuropsych Testing Results



Lab and Screening Results

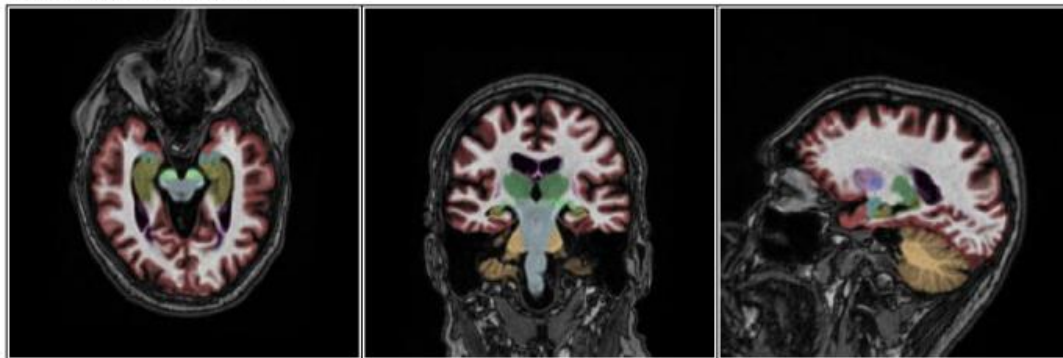
- ▶ RPR - nonreactive
- ▶ B12 - 652
- ▶ TSH - 1.44

- ▶ PHQ -9: 2
- ▶ GAD-7: 0



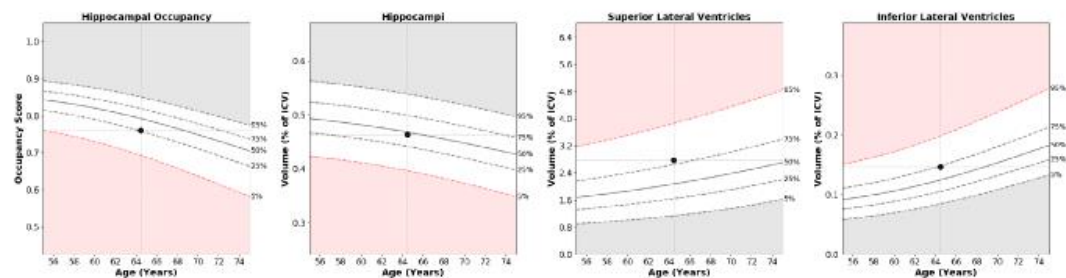
See MRI
scans

MORPHOMETRY RESULTS



Brain Structure	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Hippocampal Occupancy Score (HOC)	0.76	N/A	27
Hippocampi	7.04	0.46 (0.40 - 0.54)	46
Superior Lateral Ventricles	42.21	2.78 (1.14 - 3.86)	79
Inferior Lateral Ventricles	2.22	0.15 (0.08 - 0.20)	74

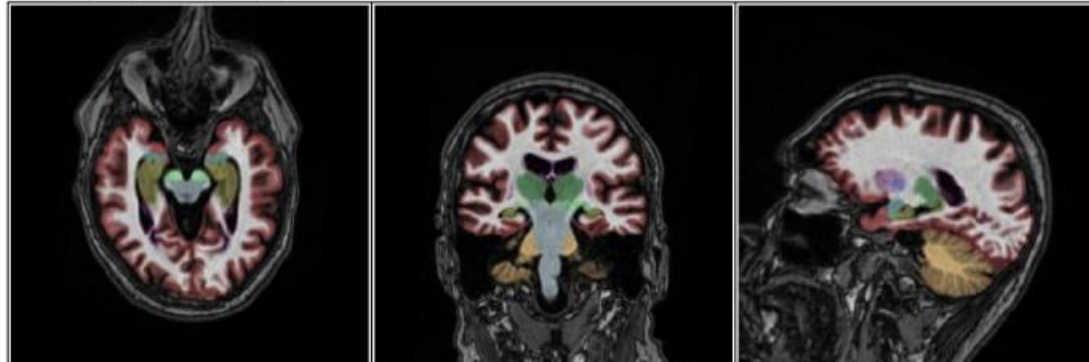
AGE AND SEX MATCHED REFERENCE CHARTS



*The Hippocampal Occupancy Score is defined as $\left(\frac{\text{Left Hippocampal Volume}}{\text{Left Hippocampal Volume} + \text{Left ILV Volume}} \right) + \left(\frac{\text{Right Hippocampal Volume}}{\text{Right Hippocampal Volume} + \text{Right ILV Volume}} \right) / 2.0$

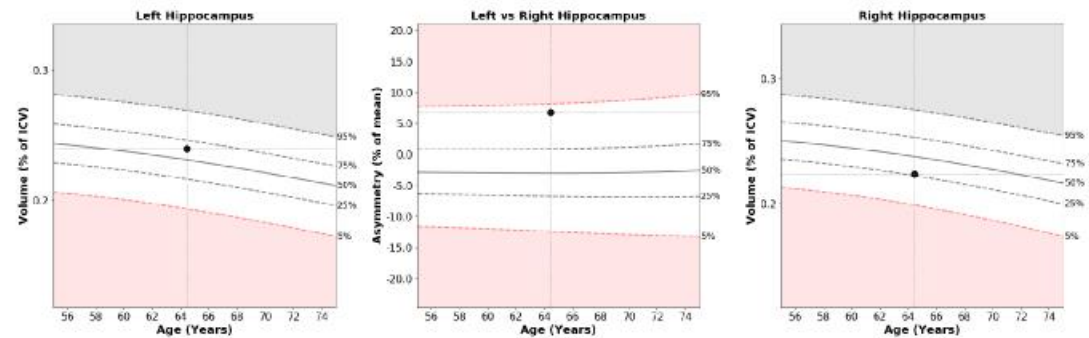
NeuroQuant Readings

MORPHOMETRY RESULTS



Hippocampus	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Left	3.64	0.24 (0.19 - 0.27)	65
Right	3.40	0.22 (0.20 - 0.28)	27
Left-Right Asymmetry Index*: 6.8			93

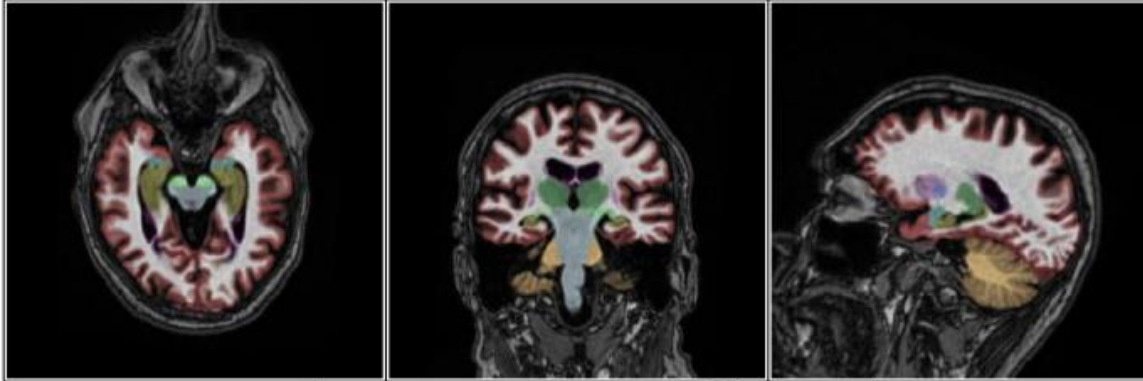
AGE AND SEX MATCHED REFERENCE CHARTS



*The Asymmetry Index is defined as the percentage difference between left and right volumes divided by their mean.

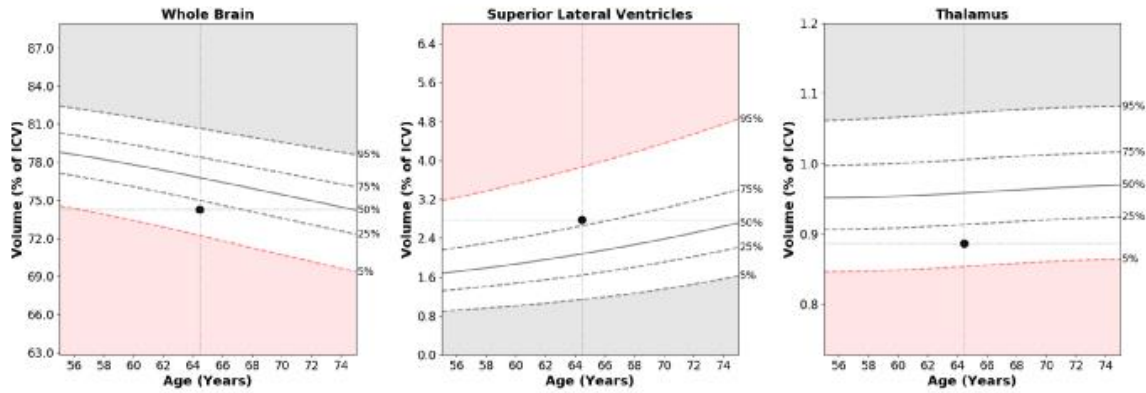
NeuroQuant Readings

MORPHOMETRY RESULTS (1 of 2)



Brain Structure	Volume (cm ³)	% of ICV (5%-95% Normative Percentile)	Normative Percentile
Whole Brain	1127.48	74.27 (72.22 - 80.67)	17
Superior Lateral Ventricles	42.21	2.78 (1.14 - 3.86)	79
Thalamus	13.46	0.89 (0.85 - 1.07)	13

AGE AND SEX MATCHED REFERENCE CHARTS



NeuroQuant Readings

MRI Review

- ▶ Hippocampal occupancy within normal range; right hippocampus volume loss greater than left
- ▶ Moderate frontal and parietal cortical volume loss
- ▶ Lateral ventricles within normal range

Differential Diagnosis

- ▶ MCI
- ▶ Alzheimer's

LP Results

- ▶ A-beta 42
 - ▶ 517.1
- ▶ T-Tau
 - ▶ 1431.2
- ▶ P-Tau
 - ▶ 190
- ▶ ATI
 - ▶ 0.27
- ▶ Consistent with Alzheimer's

Diagnosis

- ▶ Alzheimer's Disease
 - ▶ Recommend to continue Donepezil 10 mg QD
 - ▶ Recommend Memantine 5 mg QD as symptoms progress
 - ▶ Recommend Mediterranean diet
 - ▶ Recommend increased brain healthy activities and exercise