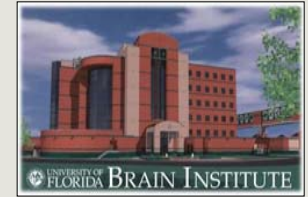


# Apathy in the Absence of Cognitive Frontal Lobe Deficits: A Case Study



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## BACKGROUND

Apathy is a mood disturbance involving symptoms such as loss of interest, reliance on others to structure one's activities, and flattened affect.

Apathy often occurs in the context of dementia (e.g. Alzheimer's disease, Frontotemporal dementia, etc). Recent findings from the dementia literature have suggested strong relationships between apathy and cognitive deficits of frontal lobe function in particular.

**Objective:** To describe a patient who was profoundly apathetic, secondary to radiation necrosis involving the bifrontal mesial frontal regions, yet maintained average performance on cognitive tests of frontal lobe functioning.

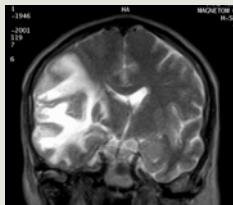
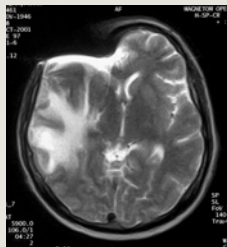
## METHODS

**Case:** 55 year-old right handed man; business executive with 14 years of education. Prior to illness, he successfully managed his own medical supply company.

He developed throat cancer, and underwent radiation therapy for carcinoma in his right maxillary sinus and left tonsil.

Four years after he initiated radiation therapy, he was diagnosed with radiation necrosis and encephalomalacia of the right anterior temporal lobe and bilateral mesial frontal lobes.

He underwent extensive neuropsychological evaluation to assess his behavioral and cognitive profile.



## RESULTS

### NEUROPSYCHOLOGICAL FUNCTIONING

#### General Intellectual Performance:

- WASI estimated IQ:
- Average range (Full-Scale IQ = 103; 58<sup>th</sup> percentile).
- Verbal IQ of 99; 47<sup>th</sup> percentile
- Performance IQ of 105; 63<sup>rd</sup> percentile.

#### Frontal lobe, Memory, and Processing Speed Performance:

MEMORY	%ile	FRONTAL LOBE FUNCTION	%ile
Wechsler Memory Scale III		Trails B	16 <sup>th</sup>
Logical Memory I	95 <sup>th</sup>	Wisconsin Card Sort Test	
Logical Memory II	91 <sup>st</sup>	Completed six categories	>16 <sup>th</sup>
Visual Reproductions I	84 <sup>th</sup>	Perseverative Errors	68 <sup>th</sup>
Visual Reproductions II	97 <sup>th</sup>	WAIS-III Digits Backward	36 <sup>th</sup>
California Verbal Learning Test-II			
List A: Total Trials 1-5	86 <sup>th</sup>	FACE DISCRIMINATION	
Short Delay Free Recall	69 <sup>th</sup>	Benton Face Recognition	Mod Imp
Long Delay Free Recall	50 <sup>th</sup>		
Rey-Osterreith Figure		PROCESSING SPEED	
Immediate Recall	84 <sup>th</sup>	Digit Symbol	16 <sup>th</sup>
Delayed Recall	75 <sup>th</sup>	Trails A	0.5

### MOOD SYMPTOMS

The patient's mood was assessed using the Beck Depression Inventory II (BDI-II) and the State Trait Anxiety Inventory (STAI). Information regarding symptoms of apathy were obtained by a thorough clinical interview.

- Borderline range for depression (BDI II= 14)
- WNL for anxiety (STAI state SS = 49; trait = 54).
- Of note, on the BDI he endorsed items indicating a loss of interest (overlapping symptoms of apathy).

Interview revealed pt met criteria for syndrome of apathy: lack of motivation, loss of productivity (e.g. pt reported he "sits around doing nothing"), lack of socialization, loss of interest, anergia, flattened emotions w/o experiencing sadness

## CONCLUSION

### Summary of Findings:

The patient met criteria for a syndrome of apathy (ex.. lack of motivation, social withdrawal, flattened affect). His neuropsychological profile suggested average intellectual functioning. Additionally, memory for both verbal (e.g. Logical Memory, CVLT-II) and visual (e.g. Visual Reproduction, Rey-O) materials was excellent.

Neurocognitive deficits involved reduced processing speed and impaired performance on face discrimination tasks. Similar difficulty with face processing has been reported following right temporal lobe lesions. This patient's right anterior temporal lobe encephalomalacia may be responsible for his deficits in facial discrimination.

Tests of cognitive frontal lobe functioning were within normal limits. Despite recent reports that apathy is associated with deficits in frontal lobe functioning, this patient performed well on tasks of cognitive frontal lobe functioning in the context of a syndrome of apathy.

Of note, this patient exhibited insight into his symptoms of apathy. He was extremely articulate in describing his symptoms. He even reported feeling perplexed because he was exhibiting some depression symptoms but he did not feel sad or hopeless.

Anatomically, apathy is thought to be related to the medial frontal/ anterior cingulate cortex. Reportedly, patients with an extreme version of apathy—akinetic mutism—have been shown to have lesions in this area. It is likely that the current patient exhibited apathy as a result of damage to his medial bifrontal regions.

**In sum, results from this case study suggests that apathy may not always be linked to cognitive frontal lobe deficits.**