

Supplemental Online Content

Devanand DP, Lee S, Huey ED, Goldberg TE. Associations between neuropsychiatric symptoms and neuropathological diagnoses of Alzheimer disease and related dementias. *JAMA Psychiatry*. Published online February 16, 2022.
doi:10.1001/jamapsychiatry.2021.4363

eTable 1. Frequencies of NPI-Q domain scores (present at any time-point) and neuropathology subtypes (present/absent)

eTable 2. Linear regression analyses of neuropathology subtypes (present/absent) on mean NPI-Q scores during follow-up

eTable 3. Prevalence of single vs concurrent apathy and disinhibition in Frontotemporal Lobar Degeneration and Hippocampal Sclerosis

This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Frequencies of NPI-Q domain scores (present at any time-point) and neuropathology subtypes (present/absent)

NPI-Q Domain Ever Present	AD		LBD		CAA		CVD		FTLD		HS		NP	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Number	1246	518	658	1137	1117	681	568	1237	303	1474	254	1497	131	1677
Delusions %	36	17	36	27	35	24	30	31	21	32	38	29	18	32
Hallucinations %	26	10	29	17	24	17	18	23	10	24	22	21	15	22
Agitation/aggression %	64	52	63	59	65	54	60	61	54	62	68	59	55	61
Dysphoria/depression %	62	55	65	57	61	59	62	59	58	60	61	60	53	61
Anxiety %	68	52	69	61	67	58	63	64	58	65	65	64	47	65
Euphoria/elation %	15	13	15	14	15	14	13	16	16	15	16	14	13	15
Apathy %	70	64	72	66	69	66	64	70	77	66	80	66	60	69
Disinhibition %	49	44	48	47	48	47	45	48	49	47	61	45	41	48
Irritability/lability %	66	56	64	63	66	58	65	62	58	64	69	62	52	64
Aberrant motor behavior %	49	40	49	45	48	45	41	50	49	46	57	45	41	47
Sleep/nighttime behavior %	62	60	65	58	62	58	61	60	60	61	66	60	57	61
Appetite/eating %	59	60	60	58	59	58	57	60	61	59	61	58	57	59

AD: Alzheimer’s disease (intermediate or high ABC criteria), LBD: Lewy Body disease, CAA: Cerebral Amyloid Angiopathy, CVD: cerebrovascular disease, FTLD: Fronto-temporal Dementia, HS: Hippocampal Sclerosis, NP: No Pathology. Frequencies were rounded to the nearest integer.

eTable 2. Linear regression analyses of neuropathology subtypes (present/absent) on mean NPI-Q scores during follow-up

NPI-Q Domain	AD	LBD	CAA	CVD	FTLD	HS	NP
Delusions	0.16 (0.11-0.21)*	0.07 (0.03-0.12)*	0.1 (0.05-0.14)*	0.01 (-0.04-0.06)	-0.11 (-0.16--0.05)*	0.01 (-0.05-0.07)	-0.11 (-0.19--0.02)*
Hallucinations	0.11 (0.07-0.15)*	0.13 (0.09-0.16)*	0.06 (0.02-0.1)*	-0.02 (-0.07-0.02)	-0.12 (-0.17--0.07)*	-0.04 (-0.09-0.02)	-0.06 (-0.14-0.01)
Agitation/Aggression	0.12 (0.06-0.18)*	0.01 (-0.05-0.07)	0.09 (0.03-0.15)*	0.04 (-0.03-0.1)	-0.11 (-0.18--0.03)*	0.05 (-0.03-0.14)	0.05 (-0.06-0.17)
Dysphoria/Depression	0.02 (-0.04-0.08)	0.06 (0.01-0.12)	-0.01 (-0.07-0.04)	0.02 (-0.04-0.08)	-0.03 (-0.1-0.04)	-0.09 (-0.17--0.01)	0.06 (-0.05-0.16)
Anxiety	0.16 (0.09-0.22)*	0.07 (0.01-0.13)	0.07 (0.01-0.13)	0.02 (-0.05-0.08)	-0.05 (-0.13-0.03)	0.06 (-0.02-0.15)	-0.16 (-0.27--0.04)*
Euphoria/Elation	-0.01 (-0.05-0.02)	-0.03 (-0.06-0)	-0.02 (-0.05-0.01)	0.01 (-0.02-0.04)	0.04 (0.01-0.08)	0.03 (-0.01-0.07)	0.02 (-0.03-0.08)
Apathy	-0.03 (-0.11-0.05)	0.05 (-0.02-0.12)	-0.03 (-0.11-0.04)	-0.02 (-0.11-0.06)	0.23 (0.13-0.32)*	0.17 (0.07-0.28)*	0.03 (-0.1-0.17)
Disinhibition	-0.09 (-0.15-0.02)*	-0.08 (-0.14-0.02)*	-0.09 (-0.15-0.03)*	0.01 (-0.06-0.07)	0.14 (0.06-0.22)*	0.15 (0.07-0.24)*	0.11 (0-0.23)
Irritability/Lability	0.08 (0.01-0.14)	-0.01 (-0.07-0.05)	0.05 (-0.01-0.11)	0.04 (-0.02-0.11)	-0.04 (-0.12-0.04)	0.03 (-0.05-0.11)	0.03 (-0.08-0.14)
Aberrant Motor Behavior	0.01 (-0.06-0.07)	-0.03 (-0.09-0.03)	-0.02 (-0.08-0.04)	-0.01 (-0.08-0.05)	0.11 (0.03-0.19)*	0.09 (0.01-0.17)	0.03 (-0.09-0.14)
Sleep/nighttime Behavior	-0.02 (-0.09-0.05)	0.11 (0.04-0.17)*	-0.04 (-0.11-0.02)	0.05 (-0.01-0.12)	0.08 (0-0.16)	-0.01 (-0.1-0.08)	-0.02 (-0.13-0.1)
Appetite/Eating Disturbances	-0.08 (-0.14-0.02)*	-0.01 (-0.07-0.05)	-0.08 (-0.13-0.02)*	0.04 (-0.02-0.11)	0.14 (0.07-0.21)*	0.01 (-0.07-0.09)	0.08 (-0.03-0.18)

All regression analyses were adjusted for age at death, sex, and difference in years between NPI-Q assessment and death. Standardized Beta coefficients with 95% confidence intervals are reported in the table.

AD: Alzheimer’s disease (intermediate or high ABC criteria), LBD: Lewy Body disease, CAA: Cerebral Amyloid Angiopathy, CVD: cerebrovascular disease, FTLD: Fronto-temporal Dementia, HS: Hippocampal Sclerosis, NP: No Pathology.

*p<.05 after multiple comparisons correction controlling for false discovery rate.

eTable 3. Prevalence of single vs concurrent apathy and disinhibition in Frontotemporal Lobar Degeneration and Hippocampal Sclerosis

<i>FTLD/HS</i>	<i>Apathy and Disinhibition</i>				
	No	Disinhibition only	Apathy only	Both	Total
No FTLD, No HS	343 28.1 %	96 7.9 %	326 26.7 %	456 37.3 %	1221 100 %
HS only	29 14.1 %	14 6.8 %	52 25.2 %	111 53.9 %	206 100 %
FTLD only	50 20 %	14 5.6 %	84 33.6 %	102 40.8 %	250 100 %
Both FTLD and HS	5 11.1 %	1 2.2 %	11 24.4 %	28 62.2 %	45 100 %
<i>Total</i>	427 24.8 %	125 7.3 %	473 27.5 %	697 40.5 %	1722 100 %

FTLD: Frontotemporal Lobar Degeneration. HS: Hippocampal Sclerosis.