Supplemental Online Content

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

eTable 1. Neurodegenerative Parkinsonism Diagnostic Codes

	ICD9		ICD10
Parkinson's disease (PD)	332.0	PD	G20
Corticobasal degeneration (CBD)	331.6	Pantothenate kinase-associated neurodegeneration	G23.0
Dementia with Lewy bodies (DLB)	331.82	Progressive supranuclear palsy (PSP)	G23.1
Other degenerative diseases of basal ganglia	333.0	Striatonigral degeneration (MSA)	G23.2
		Other degenerative diseases of basal ganglia (specified)	G23.8
		Other degenerative diseases of basal ganglia (unspecified)	G23.9
		DLB	G31.83
		CBD	G31.85
		Multiple system atrophy (MSA)	G90.3

eTable 2. Prodromal Feature Diagnostic Codes

	ICD9		ICD10	
RBD	327.42	RBD	G47.52	RBD
Constipation	560.32	Fecal impaction	K56.41	Fecal impaction
	564.00	Constipation, unspecified	K58.1	IBS with constipation
	564.01	Slow transit constipation	K59.00	Constipation, unspecified
	564.09	Other constipation	K59.01	Slow transit constipation
			K59.04	Chronic idiopathic constipation
			K59.09	Other constipation
Olfactory impairment	781.1	Disturbances of sensation of smell and taste	R43.0	Anosmia
			R43.1	Parosmia
			R43.2	parageusia
			R43.8	other disturbances of smell and taste
			R43.9	unspecified disturbances of smell and taste
Depression	296.0x	Bipolar 1 single episode	F30.x	Manic episode
	296.1x	Manic disorder, recurrent	F31.x	Bipolar disorder
	296.2x	Major depressive episode	F32.x	Depressive episode
	296.3x	Major depressive disorder, recurrent	F33.x	Depressive disorder, recurrent
	296.4x	Bipolar 1 most recent episode, manic	F43.2x	Adjustment disorders
	296.5x	Bipolar 1 most recent episode, depressed		
	296.6x	Bipolar 1 most recent episode, mixed		
	296.7	Bipolar 1 most recent episode, unspecified		
	296.8x	Other bipolar disorders		
	296.9x	Unspecified episodic mood disorder		
	300.4	Dysthymic disorder		
	309.x	Adjustment disorders		
	311	Depressive disorder not elsewhere classified		
Anxiety	300.0x	Anxiety states	F40.x	Phobic anxiety disorders
	300.2x	Phobic disorders	F41.x	Other anxiety disorders
Tremor	333.1	Essential tremor	G25.0	Essential tremor
	781.0	Abnormal involuntary movements	G25.1	Tremor unspecified
			G25.2	Other specified forms of tremor
Erectile dysfunction (ED)	607.84	Impotence of organic origin	N52.0x	Vasculogenic ED
			N52.1	ED due to diseases classified elsewhere
			N52.8	Other male ED
			N52.9	Male ED unspecified
Urinary dysfunction	788.2	Retention of urine	N31.x	Neuromuscular dysfunction of bladder
	788.21	bladder incomplete emptying	N39.3	Stress incontinence
	788.29	retention of urine specified	N39.4x	Other specified incontinence

	788.3x	Urinary incontinence		
	788.62	Urgency		
	788.63	Hesitancy		
Seborrheic dermatitis	690.1	Seborrheic dermatitis, unspecified	L21.0	Seborrhea capitis
	690.11	Seborrhea capitis	L21.8	Other seborrheic dermatitis
	706.3	Seborrhea	L21.9	Seborrheic dermatitis, unspecified

RBD = REM sleep behavior disorder, IBS = irritable bowel syndrome

eTable 3. Prodromal Feature Frequencies and Likelihood Ratios (LRs)

Feature	PD (n=430)	No PD or neurodegenerative parkinsonism (N=157,637)	Internal LR+	Internal LR-	MDS LR+[1]	MDS LR-
RBD	48 (11.16%)	134 (0.085%)	129	na	130	na
Olfactory impairment	10 (2.33%)	686 (0.44%)	5.34	na	6.4	na
Constipation	134 (31.16%)	15,860 (10.06%)	3.1	0.77	2.5	0.82
Depression	273 (63.49%)	68,974 (43.75%)	1.45	0.65	1.6	0.88
Anxiety	222 (51.63%)	48,149 (30.54)	1.69	0.70	na	na
Tremor	101 (23.49%)	2,318 (1.47%)	16	na	9.6	na
Erectile dysfunction	134 (31.16%)	32,424 (20.57%)	1.52	0.87	3.4	0.87
Urinary dysfunction	77 (17.91%)	8,699 (5.52%)	3.24	na	2.0	na
Seborrheic dermatitis	38 (8.64%)	5,771 (3.66%)	2.41	na	na	na

na = not-applicable; RBD = REM sleep behavior disorder; PD = Parkinson's disease; LR = likelihood ratio; MDS = Movement Disorders Society

References

1. Heinzel S, Berg D, Gasser T, et al. Update of the MDS research criteria for prodromal Parkinson's disease. *Mov Disord.* 2019;34(10):1464-1470.

eTable 4. Full ATSDR Cohort Characteristics

Variable	Lejeune	Pendleton	Total
Full ATSDR Cohort Characteristics			
Total n	172,128	168,361	340,489
Mean Age at follow up (SD)	58.30 (7.04)	58.41 (7.16)	58.36 (7.10)
Proportion aged < 50	11,766 (6.84%)	11,981 (7.12%)	24,747 (6.97%)
Proportion aged 50-59	75,099 (43.63%)	71,066 (42.21%)	146,165 (42.93%)
Proportion aged 60-69	84,147 (48.89%)	84,003 (49.89%)	168,615 (49.38%)
Proportion aged ≥ 70	1,116 (0.65%)	1,311 (0.78%)	2,427 (0.71%)
Age when residence at Camp began Mean years (SD)	19.77 (2.33)	20.01 (2.51)	19.89 (2.43)
Female n (%)	8,627 (5.01%)	5,930 (3.52%)	4,557 (4.28%)
Race n (%)			
White	127,483 (74.06%)	130,980 (77.80%)	258,463 (75.91%)
Black	40,117 (23.31%)	28,647 (17.02%)	68,764 (20.20%)
Other	4,410 (2.56%)	8,453 (5.02%)	12,863 (3.78%)
Rank % officers (vs. enlisted)	6,574 (3.28%)	7,568 (4.50%)	14,142 (4.15%)
Months lived on base during 1975-85, Mean (SD)	23.45 (16.66)	21.40 (15.73)	22.44 (12,64)
VHA usage n (% of total)	79,420 (46.14%)	67,356 (40.00%)	146,776 (43.11%)
Medicare usage n (% of total)			
VHA & Medicare	10,281 (5.97%)	8,003 (4.75%)	18,284
Medicare only	5,404 (3.14%)	5,942 (3.53%)	11346
VHA *or* Medicare usage n (% of total)	84,824 (49.28%)	73,298 (43.54%)	158,122 (46.44%)
VHA *or* Medicare usage before 1/13/2017 n (% of total)	75,650 (43.95%)	65,684 (39.01%)	141,334 (41.51%)

ATSDR = Agency for Toxic Substances and Disease Registry; SD = standard deviation; VHA = Veterans Health Administration

eTable 5. Characteristics of Those With VHA and/or Medicare Usage (in Current Study)

Variable	Lejeune	Pendleton	Total
VHA *or* Medicare usage n	84,824	73,298	158,122
Female n (%)	4,491 (5.29%)	2,811 (3.84%)	7,302 (4.62%)
Race n (%)			
White	57,331 (67.59%)	52,082 (71.06%)	109,413 (69.2%)
Black	25,196 (29.70%)	17,141 (23.39%)	42,337 (26.8%)
Other	2,291 (2.70%)	4,050 (5.53%)	6,341 (4.0%)
Hispanic ethnicity n (%)	5,068 (5.97%)	6,904 (9.42%)	11,972 (7.6%)
Deceased n (%)	1,600 (1.90%)	1,745 (2.38%)	3,345 (2.1%)
Age at end of follow up			
Mean years (SD)	59.64 (4.43)	59.80 (4.62)	59.72 (4.52)
Proportion aged < 50	2,310 (2.72%)	2,287 (3.72%)	4,597 (2.91%)
Proportion aged 50-59	36,461 (42.98%)	29,812 (40.67%)	66,273 (41.91%)
Proportion aged 60-69	45,310 (53.42%)	40,368 (55.07%)	85,678 (54.18%)
Proportion aged $\geq$ 70	743 (0.88%)	832 (1.14%)	1,575 (1.00%)
Age when residence at Camp began Mean years (SD)	19.89 (2.45)	20.18 (2.70)	20.03 (2.57)
Months lived on base during 1975-85, Mean (SD)	24.96 (17.41)	22.65 (16.58)	23.89 (17.07)
Rank % officers (vs. enlisted)	3.03%	3.82%	3.39%

SD = standard deviation; VHA = Veterans Health Administration

eTable 6. Characteristics of Those Without VHA or Medicare Usage (Not in Current Study)

Variable	Lejeune	Pendleton	Total
Total n without VHA or Medicare usage	87,304	95,063	182,367
Female n (%)	4,136(4.74%)	3,119(3.28%)	7,255(3.98%)
Race n (%)			
White	70,167 (80.37%)	78,931 (83.03%)	149,098 (81.76%)
Black	14,921 (17.09%)	11,507 (12.10%)	26,428(14.49%)
Other	2,145 (2.46%)	4,489(4.72%)	6,634 (3.64%)
Hispanic ethnicity n (%)	n/a	n/a	a/a
Deceased n (%)	8,587 (9.84%)	8,763 (9.22%)	17,350 (9.51%)
Age at end of follow up			
Mean years (SD)	56.95 (8.68)	57.29 (8.48)	57.13 (8.53)
Proportion aged < 50	9,133 (10.48%)	9,300 (9.78%)	18,438 (10.11%)
Proportion aged 50-59	39,241 (44.95%)	41,897 (44.07%)	81,138 (44.49%)
Proportion aged 60-69	38,563 (44.17%)	43,389 (45.64%)	81,952 (44.94%)
Proportion aged ≥ 70	362 (0.41%)	477 (0.50%)	839 (0.46%)
Age when residence at Camp began Mean years (SD)	19.65 (2.21)	19.87 (2.35)	19.77 (2.28)
Months lived on base during 1975-85, Mean (SD)	21.98 (15.77)	20.45 (14.98)	21.18 (15.37)
Rank % officers (vs. enlisted)	4,005 (4.59%)	4,769 (5.02%)	8,774 (4.81%)

SD = standard deviation; VHA = Veterans Health Administration

eTable 7. Prodromal Risk Score Associations With Camp in Persons Without PD or Other Neurodegenerative Parkinsonism

Model[a]			
Multiple Linear Regression	**Lejeune b**	**Standard Error**	**p-value**
Internal-Prodromal risk score[b]			
Overall	0.034	0.006	<0.001
Men only	0.033	0.0062	<0.001
Men only, adjusted for VHA usage duration	0.0375	0.0057	<0.001
MDS-Prodromal risk score[c]			
Overall	0.032	0.0048	<0.001
Men only	0.032	0.0049	<0.001
Men only, adjusted for VHA usage duration	0.035	0.0046	<0.001
Logistic Regression dichotomized at 99%ile	**Lejeune OR**	**95%CI**	**p-value**
Internal-Prodromal risk score			
Men only (n=1397 ≥99%ile)	1.14	1.02-1.27	0.02
Men only, adjusted for VHA usage duration	1.16	1.04-1.29	0.007
Women only (n=104 ≥99%ile)	1.15	0.78-1.72	0.48
MDS-Prodromal risk score			
Men only	1.17	1.05-1.31	0.005
Men only, adjusted for VHA usage duration	1.20	1.07-1.34	0.002
Women only	1.33	0.78-2.27	0.30

[a]All models include age, sex (as applicable), race, ethnicity; [b]Prodromal risk score using internally derived likelihood ratios; [c]Prodromal risk score using MDS likelihood ratios

PD = Parkinson's disease; MDS = Movement Disorders Society; OR = odds ratio; CI = confidence interval; VHA = Veterans Health Administration