

## Supplementary Online Content

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**eTable 1.** Concepts and Terms Defining Prostate Cancer and Alzheimer Disease in Clinical Text Analysis

<b>String</b>	<b>Drug/Event</b>	<b>Concept Unique Identifier</b>
dementia	Dementia	C0011265
alzheimer's disease	Dementia	C0002395
alzheimer disease	Dementia	C0002395
alzheimer's dementia	Dementia	C0002395
vascular dementia	Dementia	C0011269
frontotemporal dementia	Dementia	C0338451
senile dementia	Dementia	C0002395
alzheimer dementia	Dementia	C0002395
multi-infarct dementia	Dementia	C0011263
disease, alzheimer	Dementia	C0002395
dementias	Dementia	C0497327
multiinfarct dementia	Dementia	C0011263
disease, alzheimer's	Dementia	C0002395
dementia nos	Dementia	C0497327
pick disease	Dementia	C0236642
vascular dementia, uncomplicated	Dementia	C0236650
semantic dementia	Dementia	C0338462
dementia in alzheimer's disease	Dementia	C0002395
multi infarct dementia	Dementia	C0011263
pick's disease	Dementia	C0236642
alzheimer type dementia	Dementia	C0002395
senile dementia uncomp	Dementia	C0011268
early onset alzheimer disease	Dementia	C0750901
dementia, vascular	Dementia	C0011269
dementia, nos	Dementia	C0497327
dementia, alzheimer type	Dementia	C0002395
dementia, unspecified	Dementia	C0497327
unspecified dementia	Dementia	C0497327
presenile dementia	Dementia	C0011265
senile dementia with delirium	Dementia	C0154315
binswanger's disease	Dementia	C0270786
frontotemporal dementias	Dementia	C0338451
dementia, multiinfarct	Dementia	C0011263
dementia alzheimer's type	Dementia	C0002395
vascular dementia with delirium	Dementia	C0236651
dementia in conditions classified elsewhere	Dementia	C0338632
senile dementia, uncomplicated	Dementia	C0011268
frontotemporal lobe dementia	Dementia	C0338451

<b>String</b>	<b>Drug/Event</b>	<b>Concept Unique Identifier</b>
dementia, senile	Dementia	C0002395
dementia, multi-infarct	Dementia	C0011263
subcortical leukoencephalopathy	Dementia	C0270786
dementia vascular	Dementia	C0011269
late onset alzheimer disease	Dementia	C0494463
picks disease	Dementia	C0236642
alzheimer's disease with early onset	Dementia	C0750901
senile dementia, alzheimer type	Dementia	C0002395
dementia in alzheimer's disease with early onset	Dementia	C0750901
binswanger's dementia	Dementia	C0270786
subcortical vascular dementia	Dementia	C0393561
dementia, semantic	Dementia	C0338462
senile dementia with paranoia	Dementia	C0338630
senile delusion	Dementia	C1269750
binswanger disease	Dementia	C0270786
alzheimer disease, late onset	Dementia	C0494463
pre-senile dementia	Dementia	C0011265
alzheimer's dis	Dementia	C0002395
multi-infarct, dementia	Dementia	C0011263
vascular dementias	Dementia	C0011269
disease, pick	Dementia	C0236642
vascular dementia with depressed mood	Dementia	C0236653
dementia, frontotemporal	Dementia	C0338451
multi-infarct dementias	Dementia	C0011263
alzheimer disease, early onset	Dementia	C0750901
chronic progressive subcortical encephalopathy	Dementia	C0270786
dementia, multi infarct	Dementia	C0011263
disease, pick's	Dementia	C0236642
multi-infarct dementia with delirium	Dementia	C0236651
dementia in conditions ec	Dementia	C0338632
dementia, presenile	Dementia	C0011265
dementia in alzheimer's disease with late onset	Dementia	C0494463
dementia due to pick's disease	Dementia	C0236642
dementia multi-infarct	Dementia	C0011263
senile dementia nos	Dementia	C0011268
alzheimer's disease with late onset	Dementia	C0494463
adenocarcinoma of prostate	Prostate Cancer	C0007112
adenocarcinoma of the prostate	Prostate Cancer	C0007112
ca - cancer of prostate	Prostate Cancer	C0376358
ca prostate	Prostate Cancer	C0376358

cancer of prostate	Prostate Cancer	C0376358
<b>String</b>	<b>Drug/Event</b>	<b>Concept Unique Identifier</b>
cancer of the prostate	Prostate Cancer	C0376358
cancer, prostate	Prostate Cancer	C0376358
cancer, prostatic	Prostate Cancer	C0376358
cancers, prostate	Prostate Cancer	C0376358
carcinoma of prostate	Prostate Cancer	C0600139
carcinoma of the prostate	Prostate Cancer	C0600139
carcinoma prostate	Prostate Cancer	C0600139
carcinoma prostatic	Prostate Cancer	C0600139
ductal adenocarcinoma of the prostate	Prostate Cancer	C0349672
embryonal rhabdomyosarcoma of the prostate	Prostate Cancer	C1335508
endometrioid carcinoma of the prostate	Prostate Cancer	C0349672
hormone refractory prostate cancer	Prostate Cancer	C1328504
hormone-refractory prostate cancer	Prostate Cancer	C1328504
leiomyosarcoma of prostate	Prostate Cancer	C1335511
leiomyosarcoma of the prostate	Prostate Cancer	C1335511
malignant neoplasm of prostate	Prostate Cancer	C0376358
malignant neoplasm of the prostate	Prostate Cancer	C0376358
metastatic prostate cancer	Prostate Cancer	C0936223
metastatic prostate carcinoma	Prostate Cancer	C0936223
neuroendocrine tumor of the prostate	Prostate Cancer	C1335515
pn0 prostate cancer	Prostate Cancer	C1709722
pn1 prostate cancer	Prostate Cancer	C1709723
prostate adenocarcinoma	Prostate Cancer	C0007112
prostate cancer	Prostate Cancer	C0376358
prostate cancer metastatic	Prostate Cancer	C0936223
prostate cancer recurrent	Prostate Cancer	C0278838
prostate cancer stage i	Prostate Cancer	C0278834
prostate cancer stage ii	Prostate Cancer	C0278835
prostate cancer stage iv	Prostate Cancer	C0278837
prostate cancers	Prostate Cancer	C0376358
prostate carcinoma	Prostate Cancer	C0600139
prostate carcinoma metastatic	Prostate Cancer	C0936223
prostate ductal adenocarcinoma	Prostate Cancer	C0349672
prostate embryonal rhabdomyosarcoma	Prostate Cancer	C1335508
prostate rhabdomyosarcoma	Prostate Cancer	C1335518
prostate sarcoma	Prostate Cancer	C0238393
prostatic cancer	Prostate Cancer	C0376358
prostatic cancer metastatic	Prostate Cancer	C0936223
prostatic cancers	Prostate Cancer	C0376358

prostatic carcinoma	Prostate Cancer	C0600139
pt2 prostate cancer	Prostate Cancer	C1709725
<b>String</b>	<b>Drug/Event</b>	<b>Concept Unique Identifier</b>
pt2a prostate cancer	Prostate Cancer	C1709726
pt2b prostate cancer	Prostate Cancer	C1709727
pt2c carcinoma of prostate	Prostate Cancer	C1709728
pt2c prostate cancer	Prostate Cancer	C1709728
pt3 prostate cancer	Prostate Cancer	C1709729
pt3b prostate cancer	Prostate Cancer	C1709731
recurrent cancer of the prostate	Prostate Cancer	C0278838
recurrent prostate cancer	Prostate Cancer	C0278838
recurrent prostate carcinoma	Prostate Cancer	C0278838
rhabdomyosarcoma of prostate	Prostate Cancer	C1335518
rhabdomyosarcoma of the prostate	Prostate Cancer	C1335518
sarcoma of prostate	Prostate Cancer	C0238393
sarcoma of the prostate	Prostate Cancer	C0238393
small cell carcinoma of the prostate	Prostate Cancer	C1300585
stage i prostate cancer	Prostate Cancer	C0278834
stage ii prostate cancer	Prostate Cancer	C0278835
stage iii prostate cancer	Prostate Cancer	C0278836
stage iv prostate cancer	Prostate Cancer	C0278837

**eTable 2.** Variable *ICD-9* diagnostic Codes

<b>Term</b>	<b><i>ICD-9</i> code(s)</b>	<b><i>CPT</i> code(s)</b>
Prostate cancer	185	
Radical prostatectomy	60.5	55810-55815, 55840-55845
Dementia	290.0-290.9, 331.0-331.2 or 294.1-294.21	
Cardiovascular disease	443.9, 440.2, 428, 413, 414 (excluding 414.1x), 412, 411, 410; 410 and 412 if prior to prostate cancer diagnosis	
Diabetes	250; 357.2; 362.0-362.0X; 366.41	
Stroke	430, 431, 432, 433, 434, 436	
Malignancy	140-172; 174; 175; 179-184; 186-209.3	

**eTable 3.** Gleason Score Distribution in Available Patients (n=4360)

<b>Gleason score</b>	<b>n</b>	<b>%</b>
3	1	0.0%
4	30	0.7%
5	101	2.3%
6	2,430	55.7%
7	1,224	28.1%
8	378	8.7%
9	177	4.1%
10	19	0.4%

**eTable 4.** Traditional Multivariable Cox Proportional Hazards Regression for the Association of Androgen Deprivation Therapy with Negative Controls

<b>Outcome</b>	<b>HR (95% CI)</b>	<b>P Value</b>	<b>n*</b>
Tuberculosis	1.55 (0.90-2.65)	.11	80
Allergic rhinitis	1.32 (0.94-1.87)	.11	240
Abdominal aortic aneurysm	1.00 (0.62-1.60)	.99	136

HR, Hazard ratio; CI, confidence interval

Adjusted for age, race, smoking status, anti-coagulant, anti-platelet, anti-hypertensive and statin therapy, and history of cardiovascular disease, diabetes, stroke or malignancy

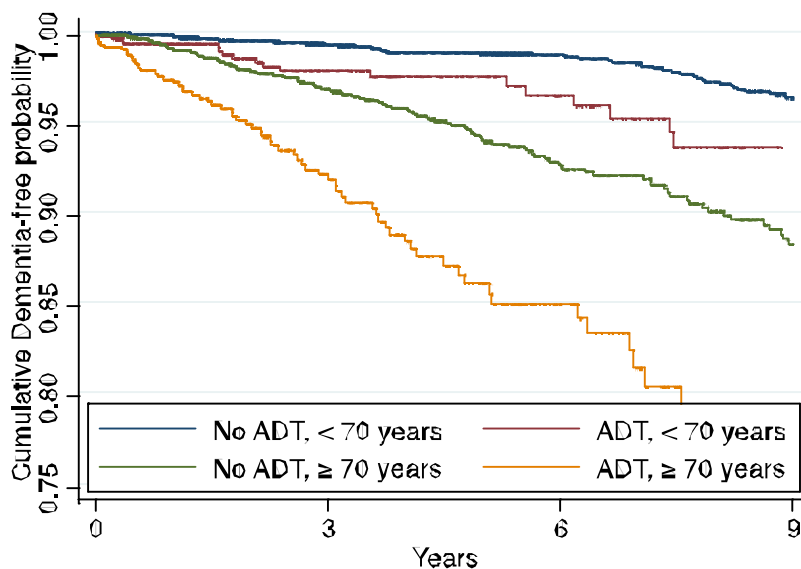
\*Number of relevant failure events



**eAppendix. Medication Names Queried to Identify Individuals on Androgen Deprivation Therapy**

Leuprolide, goserelin, triptorelin, histrelin, Degarelix , flutamide, bicalutamide, nilutamide, Enzalutamide, Cyproterone acetate, Lupron, Zoladex, Trelstar, Vantas, Firmagon, Eulexin, Casodex, Nilandron, Xtandi, Nizoral, Androcur, Eligard, Cyprostat, Anandron, Flutamin, Cytomid, Cosudex, Calutide, Kalumid

**eFigure.** Kaplan-Meier Curves Examining the Age-Stratified Cumulative Probability of Remaining Dementia Free in the Unmatched Cohort



	Number at risk									
No ADT, < 70 years	4844	3591	3114	2668	2255	1926	1602	1323	1118	913
ADT, < 70 years	925	587	448	337	251	205	171	129	102	83
No ADT, ≥ 70 years	2602	1857	1473	1221	976	782	631	510	400	301
ADT, ≥ 70 years	901	590	424	308	219	162	111	82	58	41

Non-ADT users < 70 years, n=4,844; ADT users < 70 years, n=925; Non-ADT users ≥ 70 years, n=2,602; ADT users ≥ 70 years, n=901. Each curve was independently statistically significantly different from all other curves ( $P < 0.05$ )

ADT, Androgen deprivation therapy.