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No Mental Illness Impact on Post-Aortic Valve Replacement Patients' New-Onset Atrial Fibrillation

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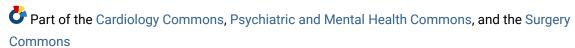natalie.kolba@stonybrookmedicine.edu

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TITLE: Mental Illness and New-Onset Postoperative Atrial Fibrillation in First-time and Repeat Surgical and Valve-in-Valve Transcatheter Aortic Valve Replacement

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PURPOSE AND SPECIFIC AIMS:

Using publicly available Statewide Planning and Research Cooperative System (SPARCS) de-identified data reports, this retrospective, observational cohort study will identify the New York State (NYS)-based rates for first time and repeat aortic valve replacement procedures. For these patients, their risk profiles, treatment rates, and short-term outcome rates will be evaluated. For our short-term outcomes, new onset postoperative atrial fibrillation, 30-day readmission rates, and 30-day STS composite outcomes will be evaluated.

Additionally, the following hypotheses will be tested:

H(0): There will be no difference in post-first time and repeat aortic valve replacement outcomes between populations with mental illness vs without mental illness for New York State between the time range 2005-2018.

Please note, the SPARCS database reports will be de-identified. As noted on the SPARCS web site, "Public use data files contain de-identified data consisting of basic record-level detail. Public use files do not contain protected health information (PHI) under HIPAA."

BACKGROUND AND SIGNIFICANCE:

There is increased prevalence of symptomatic aortic stenosis (AS) with age, a condition associated with a high chance of death when untreated (Bonow & Greenland, 2015). The current standard of care for patients with aortic disease (aortic stenosis and regurgitation) who are at a high or prohibitive risk for surgical aortic valve replacement (SAVR) is the transcatheter aortic valve replacement (TAVR) procedure (Leon et al, 2016). When a patient has to undergo a repeat AVR procedure, there are additional risks that can lead to worse outcomes. The current literature states that the in-hospital mortality rate for patients undergoing rAVR ranges between 2.3% and 17.6% (Leontyev et al, 2011). Certain risk factors such as female gender, history of coronary artery disease, and lower creatinine clearance were found to be independent predictors of early mortality (Francois et al, 2020). An additional risk factor not well identified in previous literature is a pre-operative diagnosis of a mental illness. This is a gap in knowledge because patients with mental illnesses have a higher incidence of cardiovascular disease and comorbidities (Correll et al, 2017). The focus of the current study is to fill this gap by using The New York State Statewide Planning and Research Cooperative System (SPARCS) database

RESEARCH DESIGN AND METHODS:

All analyses were performed using SAS 9.4 by an institutional core facility of data analytics. Chi square tests with exact p-value from Monte Carlo simulation were used for categorical variables and Welch's t-test used for continuous variables. Cardiovascular surgery and mental illness literature was reviewed to identify bivariable comparisons ($p < 0.10$) that were model eligible variables for multivariable logistic regression predicting POAF/AFL, STS MM, and READMIT. These variables were further refined (e.g., selecting domain-specific variables to address inherent collinearity), as appropriate. For the analyses performed, the statistical significance threshold was set at $p \leq 0.05$.

This study's **PICOS** components include:

Population: All New York State patients having undergone aortic valve replacement and repeat aortic valve replacement, excluding patients <18 yo, emergency admissions, and patients with previous aortic dissections. Patients who had a concomitant or 2-year prior coronary artery bypass graft surgery (CABG), thoracic aortic aneurysm repair (TAA) or mitral valve repair/replacement were also excluded.

Intervention: Documenting rates of preoperative diagnosis of mental illness.

Comparison: Risk factors, mental illness diagnosis before the procedure, patient demographics.

Outcomes: New onset post operative atrial fibrillation, 30-day readmission, 30-day STS composite endpoint.

Study Design: This study is a retrospective observational cohort study using SPARCS de-identified database.

REFERENCES
1. Bonow, R. O., & Greenland, P. (2015). Population-wide trends in aortic stenosis incidence and outcomes. Circulation, 131(11), 969–971. https://doi.org/10.1161/circulationaha.115.014846
2. Leon, M. B., Smith, C. R., Mack, M. J., Makkar, R. R., Svensson, L. G., Kodali, S. K., Thourani, V. H., Tuzcu, E. M., Miller, D. C., Herrmann, H. C., Doshi, D., Cohen, D. J., Pichard, A. D., Kapadia, S., Dewey, T., Babaliaros, V., Szeto, W. Y., Williams, M. R., Kereiakes, D., … Webb, J. G. (2016). Transcatheter or surgical aortic-valve replacement in intermediate-risk patients. New England Journal of Medicine, 374(17), 1609–1620. https://doi.org/10.1056/nejmoa1514616
3. Leontyev, S., Borger, M. A., Davierwala, P., Walther, T., Lehmann, S., Kempfert, J., & Mohr, F. W. (2011). Redo Aortic Valve Surgery: Early and Late Outcomes. The Annals of Thoracic Surgery, 91(4), 1120–1126. https://doi.org/10.1016/j.athoracsur.2010.12.053

4. François, K., De Backer, L., Martens, T., Philipsen, T., Van Belleghem, Y., & Bové, T. (2020). Repeat aortic valve surgery: contemporary outcomes and risk stratification. Interactive CardioVascular and Thoracic Surgery, 32(2), 213–221. https://doi.org/10.1093/icvts/ivaa257

5. Correll, C. U., Solmi, M., Veronese, N., Bortolato, B., Rosson, S., Santonastaso, P., Thapa-Chhetri, N., Fornaro, M., Gallicchio, D., Collantoni, E., Pigato, G., Favaro, A., Monaco, F., Kohler, C., Vancampfort, D., Ward, P. B., Gaughran, F., Carvalho, A. F., & Stubbs, B. (2017). Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: A large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. World Psychiatry, 16(2), 163–180. https://doi.org/10.1002/wps.20420

Codes:

Variable		
General Risk Factors	ICD 10	ICD 9
Smoking Status, n (%)	Z72.0, Z87.891, F17.200-F17.299	V15.82, 305.1
Homelessness, n (%)	Z59.0	V60.0
Cardiac Disease-related Risk Factors		
Diabetes Mellitus, n (%)	E08.00-E13.9	249.00-249.91, 250-250.03, 250.1-250.13, 250.2-250.23, 250.3-250.33, 250.4-250.43, 250.5-250.53, 250.6-250.63, 250.7-250.73, 250.8-250.83, 250.9,250.93
Peripheral Vascular Disease, n (%)	I73.00, I73.01, I73.1, I73.81, I73.89, I73.9	443.0, 443.1, 443.21, 443.22, 443.23, 443.24, 443.29, 443.81, 443.82, 443.89, 443.9
Cerebral Vascular disease, n (%)	I60-I69.998	430-438.9
Prior Stroke/Transient Ischemic Attack, n (%)	G45.0-G45.9	435.0-435.9, 437.7
COPD, n (%)	J41.0-J44.9, J45.20, J45.21, J45.22, J45.30, J45.31, J45.32, J45.40, J45.41, J45.42, J45.50, J45.51, J45.52, J45.901, J45.902, J45.909, J45.990, J45.991, J45.998, J47.0, J47.1, J47.9, J67.0, J67.1, J67.2, J67.3, J67.4, J67.5, J67.6, J67.7, J67.8, J67.9	490, 491.0, 491.1, 491.20, 491.21, 491.22, 491.8, 491.9, 492.0, 492.8, 493.00, 493.01, 493.02, 493.10, 493.11, 493.12, 493.20, 493.21, 493.22, 493.81, 493.82, 493.90, 493.91, 493.92, 494.0, 494.1, 495.0, 495.1, 495.2, 495.3, 495.4, 495.5, 495.6, 495.7, 495.8, 495.9, 496
Chronic Kidney Disease	-	-
Stage 1, n. (%)	N18.1	585.1
Stage 2, n. (%)	N18.2	585.2
Stage 3, n. (%)	N18.3	585.3
Stage 4, n. (%)	N18.4	585.4

Stage 5, n. (%)	N18.5	585.5
ESRD, n. (%)	N18.5	585.6
CKD with Dialysis, n (%)	Z99.2	V45.11
CKD without Dialysis, n (%)	N18.1-N18.9	585.1-585.9
Coronary Artery Disease, n (%)	I25-I25.9	414-414.9
Atrial Fibrillation/Flutter, n (%)	I48-I48.4, I48.9-I48.92	427.3-427.32
Previous MI, n (%)	I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I21.9, I22.0, I22.1, I22.2, I22.8, I22.9, I21.A1, I21.A9, I25.2	410.00-410.92, 412
Congestive Heart Failure, n (%)	I50.20-I50.23, I50.30-I50.33, I50.40-I50.43	428.0, 428.20-428.23, 428.30-428.33, 428.40-428.43
Prior Pacemaker/ICD, n (%)	Z98.61	V45.01, V45.02
Hyperlipidemia, n (%)	E78.49, E78.2, E78.5, E78.3, E78.1, E78.0,E78.4	272.0, 272.1, 272.2, 272.3, 272.4
Obesity, n (%)	E66-E66.9	278-278.3
BMI	Z68.1	< 19: V85.0
< 19.9	Z68.20-Z68.29	V85.1
20-29	Z68.30-Z68.39	V85.21-V85.25
30-39	Z68.41-Z68.45	V85.30-V85.39
> 40.0		V85.41-V85.44
Dyspnea, n (%)	R06.00, RO6.01, R06.02, R06.03, R06.09	786.09, 786.02, 786.05, 518.82, 770.89, 786.09
Obstructive sleep apnea, n (%)	G47.33	327.23
Hypertension, n (%)	I10, I11.0, I11.9, I12.0, I12.9, I13.0, I13.1, I13.10, I13.11, I13.2, I15, I15.0, I15.1, I15.2, I16, I16.0, I16.1, I16.9	401.0, 401.1, 401.9, 402.01, 402.11, 402.91, 402.00, 402.10, 402.90, 403.01, 403.11, 403.91, 403.00, 403.10, 403.90, 404.01, 404.11, 404.91, 404.00, 404.10, 404.90, 404.02, 404.12, 404.92, 404.03, 404.13, 404.93, 405.01, 405.11, 405.91, 405.91, 405.99, 405.09, 405.19, 405.99

Rheumatic Heart Disease, n (%)	I06.0, I06.2, I08.0, I08.2, I08.3, I335.0, I35.2, I06.1, I35.1	395.0, 395.2
Psychiatric Disease-related Risk Factors		
Alcohol abuse, n (%)	F1010, F1011, F10120, F10121, F10129, F1014, F10150, F10151, F10159, F10180, F10181, F10182, F10188, F1019, F1020, F1021, F10220, F10221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10251, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, F10921, F1094, F10950, F10951, F10959, F1096, F1097, F10980, F10981, F10982, F10988, F1099	2910-2913, 2915, 2918, 29181, 29182, 29189, 2919, 30300-30393, 30500-30503
Opioid abuse, n (%)	F11.20, F11.21, F11.22, Z79.891, Z79.899	304.01- 304.03, 305.50-305.53
Family history of other mental health and behavioral disorders, n (%)	Z81.8	V17.0
Suicide ideation, n (%)	R45.851	V62.84
Suicide attempt, n (%)	T14.91	E950-E959
Intracranial injury, n (%)	S09.90, S06	959.01, 854
Age related physical debility, n (%)	R54	797
Frailty (mental), n (%)	R41.81	797
Abnormal EEG, n (%)	R94.01	794.02
Autoimmune disease, n (%)	D89.9	273.279
Acquired coagulation factor deficiency, n (%)	D68.4	286.7
Abnormal leukocyte count, n (%)	D72.829	288.6
Other Psychiatric Disease-related Diagnoses		

PTSD n, (%)	F43.1, F43.10-F43.12	309.81
PTSD-related (adjustment disorder and stress) n, (%)	F43.21, F43.22, F43.23, F43.25, F43.29, F43.0, F43.8, F43.9	309.28
Depression n, %	F320, F321, F322, F323, F328, F3281, F3289, F329, F330, F331, F332, F333, F338, F339, F341, F4321	296.21, 296.22, 296.23, 296.24, 298.0, 298.82, 625.4, 262.20, 311, 296.31, 296.32, 296.33, 296.34, 296.99, 296.30, 300.4, 301.12, 309.0, 309.1
Generalized Anxiety Disorder, n (%)	F41.1	300.00, 300.01, 300.09, 300.21-300.23, 300.29, 300.3, 309.81
Alcohol-induced mental disorders	F10.159	291.0-291.3, 291.5, 291.8, 291.81, 291.89, 291.9
Obsessive Compulsive Disorder, n (%)	F60.5, F63.3, F63.9, F98.8	300.3
Bipolar Disorder, n (%)	F31.9, F31.0, F31.1, F31.11, F31.12, F31.13, F31.30, F31.31	296.7
Schizophrenia, n (%)	F41.0, F41.1, F41.3, F41.8, F41.9	295, 295.01, 295.02, 295.03, 295.04, 295.05, 295.10, 295.11, 295.12, 295.13, 295.14, 295.15, 295.2, 295.21, 295.22, 295.23, 295.24, 295.25, 295.3, 295.31, 295.32, 295.33, 295.34, 295.35, 295.40, 295.41, 295.42, 295.43, 295.44, 295.45, 295.5, 295.51, 295.52, 295.53, 295.54, 295.55, 295.60, 295.61, 295.62, 295.63, 295.64, 295.65, 295.7, 295.71, 295.72, 295.73, 295.74, 295.75, 295.8, 295.81, 295.82, 295.83, 295.84, 295.85, 295.90, 295.91, 295.92, 295.93, 295.94, 295.95
Mild cognitive impairment, n (%)	G31.84	331.83
Dementia, n (%)	F03.90	294.2
Complications		
Ventilator Status, n (%)	Z99.11 (dependence on respirator [ventilator] status	V46.11
Bleeding/Vascular Complications, n (%)	I97.610, I97.611, I97.618	998.11
Post-Procedural Pacemaker placement, n (%)	0JH60PZ, 0JH63PZ, 0JH80PZ, 0JH83PZ, 0JH604Z, 0JH605Z, 0JH606Z, 0JH634Z, 0JH635Z, 0JH636Z, 0JH804Z, 0JH834Z, 0JH605Z, 0JH635Z, 0JH805Z, 0JH835Z, 0JH606Z, 0JH636Z, 0JH806Z, 0JH836Z	37.80, 37.81, 37.82, 37.83
Prosthetic valve endocarditis, n (%)	B37.6, I33.0, I33.9, A52.03, M32.11, I0.01, I38, I39, I09.1, A32.82, A39.51, B33.21, I35.8, A18.84, A54.83	391.1, 112.81, 421.0, 421.1, 421.9, 093.20-093.24, 424.91,424.90, 397.9, 036.42, 074.22, 098.84,
Aortic insufficiency, n (%)	I97.11, I97.110, I97.111	429.4, 997.1
Patient medical non-compliance, n (%)	Z91.19	V15.81

Acute embolism and thrombosis, n (%)	I82.409	453.4
Pneumonia, n (%)	J18.9	486
Liver disease, n (%)	K76.9	573.9
Acute psychosis, n (%)	F23	298.9
Delirium due to other condition, n (%)	F05	293
Cardiac Valvular Disease Rates		
Aortic Stenosis Diagnosis	I35.0, I35.2	395
Aortic Regurgitation Diagnosis	I35.1	396.3
Any Aortic Disease Diagnosis	[Please see masterlist]	

SAMPLE TABLE 1: Descriptive table of SAVR/TAVR patients' baseline characteristics, risk factors and Elixhauser comorbidities by mental illness

		Overall			
Variable	Level	Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
Surgery Type	SAVR				
	TAVR				
Type of admission	Elective				
	Urgent				
Gender	Female				
	Male				
Age	Unit=year				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
Race	Black				
	Other				
Ethnicity	Hispanic				
	Other\unknown				
Insurance	Commercial				
	Medicaid\ Medicare\ Other				
Alcohol abuse	No				
	Yes				
Opioid abuse	No				
	Yes				
Family history	No				
	Yes				
Suicide ideation	No				
	Yes				
Suicide attempt	No				
Intracranial injury	No				
	Yes				
Age related physical debility	No				
	Yes				
Frailty (mental)	No				
	Yes				
Abnormal EEG	No				
Autoimmune disease	No				
	Yes				
	No				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
Acquired coagulation factor deficiency	Yes				
Abnormal leukocyte count	No				
	Yes				
Tobacco/Smoking	No				
	Yes				
Hypertension	No				
	Yes				
Congestive Heart Failure	No				
	Yes				
Cardiomyopathy	No				
	Yes				
Diabetes mellitus	No				
	Yes				
Coronary Artery Disease	No				
	Yes				
Chronic Lung Disease	No				
	Yes				
COPD	No				
	Yes				
History of Stroke	No				
	Yes				
Stroke	No				
	Yes				
Carotid Disease	No				
	Yes				
Carotid stenosis (Udesh Paper)	No				
	Yes				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
Cerebral Vascular Disease	No				
	Yes				
Peripheral Vascular Disease	No				
	Yes				
History of MI	No				
	Yes				
MI	No				
	Yes				
Permanent Pacemaker or Implantable Cardiac Defibrillator (PPM/ICD)	No				
	Yes				
Depression	No				
	Yes				
Bipolar Disorder	No				
	Yes				
Schizophrenia	No				
	Yes				
Dementia	No				
	Yes				
Bicuspid Aortic Valve	No				
	Yes				
Syncope	No				
	Yes				
Dyspnea	No				
	Yes				
Chest Pain	No				
	Yes				
Dialysis	No				

Variable	Level	Overall Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
	Yes				
Hyperlipidemia	No				
	Yes				
Elevated Lipoprotein	No				
Presence of Prosthetic Heart valve	No				
Abdominal Aortic Aneurysm	No				
	Yes				
Aortic Valve Disorders	Yes				
Non rheumatic aortic stenosis	No				
	Yes				
Rheumatic Heart Disease	No				
	Yes				
Obstructive Sleep Apnea	No				
	Yes				
Leukemia	No				
	Yes				
Lymphoma	No				
	Yes				
Chronic Kidney Disease	No				
	Stage 1				
	Stage 2				
	Stage 3				
	Stage 4				
	Stage 5				
	ESRD				
CKD, with dialysis	No				
	Yes				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
CKD, without dialysis	No				
	Yes				
Obesity	No				
	Yes				
Anemia of Deficiency, iron deficiency (Khoury paper)	No				
	Yes				
Rheumatoid arthritis/collagen vascular diseases	No				
	Yes				
Fluid and Electrolyte Disorders (Khoury paper)	No				
	Yes				
Pulmonary Hypertension (Edwards Paper)	No				
	Yes				
Platelet count (thrombocytopenia) (Tuzcu Paper)	No				
	Yes				
Previous internal cardioverter-defibrillator (Tuzcu Paper)	No				
	Yes				
Cerebral occlusion (Udesh Paper)	No				
	Yes				
Hypothyroidism (Udesh Paper)	No				
	Yes				
Intra-aortic Balloon Pump	No				
	Yes				
Elixhauser Mortality Index					
Elixhauser Readmission Index					
Congestive heart failure	No				
	Yes				
Valvular disease	No				

Variable	Level	Overall Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
	Yes				
Pulmonary circulation disease	No				
	Yes				
Peripheral vascular disease	No				
	Yes				
Hypertension (uncomplicated/complicated)	No				
	Yes				
Paralysis	No				
	Yes				
Neurodegenerative disorders	No				
	Yes				
Chronic pulmonary disease	No				
	Yes				
Diabetes (uncomplicated)	No				
	Yes				
Diabetes (complicated)	No				
	Yes				
Solid tumor w/out metastasis	No				
	Yes				
Metastatic cancer	No				
	Yes				
Hypothyroidism	No				
	Yes				
Renal failure	No				
	Yes				
Liver disease	No				
	Yes				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
Peptic ulcer Disease, excluding bleeding	No				
	Yes				
AIDS/HIV	No				
	Yes				
Lymphoma	No				
	Yes				
Rheumatoid arthritis/collagen vascular diseases	No				
	Yes				
Coagulopathy	No				
	Yes				
Obesity	No				
	Yes				
Weight loss	No				
	Yes				
Fluid and electrolyte disorders	No				
	Yes				
Blood loss anemia	No				
	Yes				
Deficiency Anemia	No				
	Yes				
Alcohol abuse	No				
	Yes				
Drug abuse	No				
	Yes				
Psychoses	No				
	Yes				
Depression	No				

Variable	Level	Overall			
		Total (N=)	w/ Mental illness (N=, %)	w/out Mental illness (N=, %)	P-value*
	Yes				

SAMPLE TABLE 2: Mental illness sub-type distribution among first-time SAVRTAVR patients

Mental illness	Frequency Count (Total=4,868)	Percent among all First-Time SAVRTAVR patients (%)
PTSD		
PTSD-related		
Depression		
Anxiety		
Alcohol-induced mental disorder		
Obsessive Compulsive Disorder		
Bipolar Disorder		
Schizophrenia		
Mild cognitive impairment		
Dementia		

SAMPLE TABLE 3: *MH breakdown table among First-SAVRTAVR patients*

Components of Mental Illness Diagnosis	Tobacco Use		p-value	POAF		p-value	30-D READM		p-value	30-D COMPEND		p-value
	Yes	No		Yes	No		Yes	No		Yes	No	
PTSD												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
PTSD-related												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%

Depression												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Depression-related												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Generalized anxiety disorder												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Alcohol induced mental disorders												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Obsessive Compulsive Disorder												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Bipolar Disorder												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Schizophrenia												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Mild cognitive impairment												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
Dementia												
Yes	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%
No	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%	n/%